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Introductory Address
ON
VACCINE THERAPY: ITS ADMINISTRATION, VALUE, AND LIMITATIONS.

Delivered before the Royal Society of Medicine on May 23rd, 1910,

BY SIR ALMROTH E. WRIGHT, M.D. DUB., F.R.S.

MR. PRESIDENT AND GENTLEMEN,—I do not conceal from myself that in opening this debate I am undertaking a task of quite exceptional difficulty. I have to set out to you such new points in connexion with vaccine therapy as may seem to me to deserve attention. I have to attempt to take the measure of the achievements of this new therapeutic method. I have to discuss its limitations. And, above all, I desire to suggest to you in connexion with all these subject-matters certain canons of criticism.

RATIONALE OF VACCINE THERAPY.

Before I embark upon these tasks I may perhaps with advantage consider for a moment the rationale of vaccine therapy. The fundamental principle of vaccine therapy, as I conceive of it, is to exploit in the interest of the infected tissues the unexercised immunising capacities of the uninfected tissues. Let me illustrate my meaning. I will take the case of a localised infection. We have here a condition in which the invading microbes are holding their own or getting the upper hand, and our object must be to turn the tables upon them. For this purpose we inoculate into some other part of the body microbes which are similar to those which the patient has to combat. Such inoculation is not, however, as the unthoughtful immediately assumed, a mere replica of the original infection. There are two points of difference. First, the microbes in the vaccine have been devitalised, so that their multiplication is impossible; secondly, the dose of vaccine is so regulated that the organism of the patient must inevitably win at the site of inoculation. Now a victory such as this is won by the elaboration of antibacterial substances, and these are generated in such a case on a scale which is more than adequate to bring about a destruction of the bacterial elements which have been incorporated. The surplus of specific antibacterial substances which have thus been elaborated will now find its way by the channel of the blood to the focus of infection. There it will bring aid to the defensive forces of the organism which before were ineffectually combating the invading microbes. The victory which the uninfected tissues have won over the microbes of the vaccine will in this way lead up to a victory of the infected tissues over the microbes they have to combat. A therapeutic method which proceeds on this newfound principle must, of course, make new demands. It will be well to realise what they are.

The medical man who has recourse to vaccine therapy ought to have a familiar acquaintance with the microbes which affect the human body. He ought to appreciate that vaccines owe their efficacy to the reaction they set up in the tissues, and not to any action exerted directly by the vaccine upon the invading microbe. He ought to have mastered the general principles of immunisation. He ought to know in connexion with each vaccine the *minimum effective dose*—i.e., the dose which gives the minimum immunising reaction without any intervening negative phase—and the *medium*, or average, dose—i.e., the dose that gives, after a negative phase, a more powerful immunising reaction. He ought to know the general conditions which affect the sensibility of the organism. He ought to understand how to adjust the dose to the requirements of the individual patient. And he ought to have a knowledge of the conditions which obtain in the focus of infection, and of the methods of circumventing the difficulties which are introduced by these conditions.

If vaccine therapy demands all this of the medical man, it is clear that the discussion of vaccine therapy must inevitably lead on the opening up of the question as to whether the medical practitioner must of necessity be a bacteriologist. If, in the course of this discussion, it becomes clear that vaccine therapy is more effective than any other method of treating bacterial disease, and if it is conceded that it holds out in very many cases the only real prospect of advantage to the patient, such concession will in reality be tantamount to a declaration that applied bacteriology is the essential and indispensable part of medicine, and that the practice of medicine must be reorganised upon that basis. If, on the contrary, the conclusion is arrived at that vaccine therapy has, as compared with other methods, only a limited utility and a limited application, this will be tantamount to a declaration that the reorganisation of medicine on the basis of bacteriology may still a little longer be postponed. Such reorganisation, of course, becomes inevitable as soon as an effective application of bacteriology has been made. Inasmuch as these are, if I understand the matter aright, the real issues which lie behind this debate, I think it will not be unprofitable if, before dealing specifically with vaccine therapy, I pass in rapid review

THE RECENT HISTORY OF MEDICINE AND OF ITS RELATIONS TO BACTERIOLOGY.

As one looks back and recognises that the successive applications of bacteriology to therapeutics stand out as great landmarks in its history, one often wonders that medicine was not long ago swept along irresistibly into the channel of bacteriology. One wonders, for instance, in connexion with the advent of antiseptic surgery why this triumphantly successful application of bacteriology was not immediately followed up by a serious attempt on the part of our profession to study and turn to account this new science. Perhaps it was that the science of bacteriology was then quite in its infancy, and perhaps that the thoughts of our profession were here too engrossed in experimentation with different antiseptics. But the dominant factor in the situation was, I feel sure, the fact that antiseptic procedures could be successfully carried out without any knowledge of bacteriology. Seeing that the action of antiseptics is exerted upon all microbes without distinction of kind, the study of bacteriology appeared to the surgeon to be merely a work of supererogation. When, following in his wake, the physician embarked upon the treatment of bacterial diseases by antiseptics, his thought followed upon the same road. He saw in antiseptics therapeutic agents which would be effective indiscriminately against all microbes, and seeing this he, like the surgeon, held himself absolved from any study of bacteriology.

In the meanwhile the science was advancing with giant strides. One by one the pathogenetic microbes with which we are now acquainted were discovered and their rôle in connexion with the production of disease was elucidated. At the same time methods for identifying and making cultivations of each of these species of microbes were gradually elaborated. Then followed the discovery of agglutination, and with this the recognition of the possibility of diagnosing the nature of a bacterial infection by testing the properties of the blood fluids. After this came the discovery of the "deflection of complement test" and the discovery of the opsonic power of the blood, and with this another and much greater extension of the method of serum diagnosis. Finally came the recognition of the possibility of inducing auto-inoculation for diagnostic uses, and with this the serum tests which previously gave assistance only when spontaneous auto-inoculations were taking place became applicable also in connexion with strictly localised infections. But the clinician has not yet been prevailed upon to reconsider his position. He still—in face of these discoveries—claims to be absolved from a study of bacteriology; and he is still bemused with the idea that the final appeal must always be to himself and to his methods of physical diagnosis.

Let me, in connexion with this fixed idea, invite you to consider the following points: (1) There was undoubtedly a time when the verdict of the pure clinician on a question of a diagnosis was incontestable. That was when the disease could be recognised and identified only by its clinical symptoms. Diphtheria then meant a condition where a particular kind of false membrane appeared on the throat, typhoid fever a fever where the temperature ran a particular course, and phthisis a disease in which certain noises could be heard down a stethoscope. With the discovery of the specific causes of these diseases came a quietus to all this. Diphtheria now means an invasion of the throat by diphtheria bacilli, typhoid fever an invasion of

the blood by the typhoid bacillus, and phthisis an invasion of the lungs by the tubercle bacillus. It is not, at this hour of the day, arguable that the verdict of a bacteriologist stands in need of confirmation from a clinician. In blunt language, "the boot is on the other foot."

Let me pass to a further point. (2) While it must be conceded that clinical methods do furnish in many cases a bacteriological diagnosis, this is reached only by a process of inference, and the chain of inference is in this case made up of a series of open links. I should not have thought it necessary to emphasise this so obvious fact were it not that I was recently assured by a reputable clinician that it had never crossed his thought that dulness over the apex of the lung did not supply proof of tuberculous infection.

And there is yet one further important point. (3) A diagnosis of the nature of a bacterial infection which is based upon the physical signs comes short not only in the respect that it can never be wholly trustworthy, but also in the respect that it must almost always be belated. For physical signs such as can be appreciated by clinical methods can, in the nature of things, be elicited only after comparatively gross physical damage has been done. I need not insist that bacteriological methods have from this point of view a great superiority. Pathogenetic microbes may, as you know, often be found in the secretions or the blood long before a diagnosis can be arrived at by clinical methods; and when methods of direct bacterial diagnosis give negative results, we can nearly always by inferential methods—by the opsonic index, or the agglutination test, or the deflection of complement test—arrive at the nature of the infection long before its clinical features have become distinctive.

While all this was, and is, uncongenial to the pure clinician, he did not fail to appreciate that there could be no question of ignoring bacteriological discoveries which were of fundamental importance for medicine. He was therefore face to face with the problem as to how to make provision for the carrying out of the necessary bacteriological tests and examinations. The proper way of confronting the situation would, of course, have been to look the future fairly and squarely in the face, and to enact that in the future no one should qualify as a medical man without some elementary knowledge of bacteriology, and that no one should proceed to any of the higher qualifications without a thorough training in this science. If that course had been taken even a few years ago—and it has not yet been taken—the younger rank and file of the profession and the younger generation of clinical teachers would now be abreast of any work which might fall to them in connexion with vaccine therapy.

There was, however, one way of escape out of the situation. This was to delegate all bacteriological work in hospitals to a special bacteriological department, and in private practice to such public or private laboratories as might be disposed to undertake it. For a time—as in the case where the Merovingian Kings delegated all their functions to the Mayors of the Palace—everything smiled upon this arrangement. In particular the next great advance in bacterial therapeutics—I refer, of course, to the serum treatment of diphtheria—seemed to fit very harmoniously into this scheme. The medical man who had divested himself of all bacteriological work found here, to his joy, that it would be practicable for him to get his diagnosis from one bacteriological laboratory and his remedy from another, and that there would still remain for himself a dignified rôle as a middleman between the patient and the bacteriologist. Moreover, this rôle would, it was anticipated, continually grow in importance as serum therapy found new application in connexion with one acute disease after another. The medical man even dreamed dreams of polyvalent sera that would make everything in the nature of minute bacteriological diagnosis superfluous. Upon this basis the march of bacteriological discovery seemed to promise advantage to the medical profession—advantage in the form of greater therapeutic success—and there would not be as counter-weight any added burden of unaccustomed labour. The advent of vaccine therapy has disturbed this carefully thought-out scheme, for it has brought home to us that bacteriological work is called for in connexion with nearly every case. And that is a fact which gives, as you will see, quite a new complexion to the proposal that the medical man should depute to others everything that relates to bacteriology. In point of fact, we are here brought up against a very fundamental question—the question as to when and under what circumstances and to what extent the skilled work of a profession may legitimately be delegated. We may here confine ourselves to the case of the delegation of skilled work in connexion with our own profession.

DELEGATION OF BACTERIOLOGICAL WORK.

It will prevent a confusion of issues if we at the outset discriminate between the case where a consultation is held over a patient and the case where a specimen is sent to a laboratory for report. In the former case the consultant is brought face to face with the patient and with the problem which is to be resolved. He is asked to undertake any examination which may seem to him required for the elucidation of the case, and to discuss the whole problem with the practitioner; and the consultant and practitioner can then, as fellow experts, consider exactly where and to what extent "functional errors"—concerning which I shall presently have something to say—may be affecting their several findings, and exactly how far these findings may be accepted as assured. And, finally, when by such collaboration a decision has been arrived at, the responsibility for any action taken rests upon the shoulders of both.

In the case where a specimen is sent to a bacteriological laboratory for report we have utterly different conditions. The bacteriologist is not brought face to face with the problem. Instead of being afforded an opportunity of obtaining his own specimen in the way that he judges best, or even an opportunity of suggesting the proper way of approaching the bacteriological investigation, he is tied down to the examination of such specimens as may be submitted to him. Again, the bacteriologist is generally very imperfectly informed with respect to the nature of the problem which is to be resolved. Moreover, when the written bacteriological report comes to hand the practitioner, who has not himself been a laboratory worker, will be quite unable to exercise any expert criticism upon it or to see where fallacies may come in. He will, in the ordinary case, assume that laboratory methods are not subject to fallacy and "functional error," and that the "Yes" of the laboratory means definitely "Yes," that the "No" of the laboratory means definitely "No," and that in the case of a laboratory result which is expressed in terms of figures, those figures must be an absolute mirror of reality. And even if it should so happen that the practitioner to whom the bacteriological report is sent has expert knowledge of laboratory work, he will, in default of personal knowledge of, and opportunity for questioning, the bacteriological worker, be quite unable to evaluate the "functional error," and to assign in accordance with this its proper value to the report.

Having discriminated the case of the consultation, which is, as we have seen, really the case of collaboration in skilled work, from the case where a specimen is referred to a laboratory for report, we have now to try to arrive at a considered decision upon the morality of that kind of delegation. Three different cases of delegation must be distinguished. The *first* is the case of a man who, being himself skilled in the whole of the work which he undertakes, has part of it carried out by an assistant, satisfying himself that it has been done in the proper manner and accepting the responsibility for this. It is the case of the delegation of duties by the honorary physician or surgeon to the resident staff of the hospital, by the director of a laboratory to his staff, and by the practitioner to the nurse. The *second* is the case of a man who, when invited to undertake work which lies outside the range of his competence, hands over that work and the attaching responsibility to another who has the special kind of skill which is required. This is the ordinary case of a practitioner sending on a case to a specialist. The *third* is the case of a man whose studies have not covered the whole of his professional work and who arranges to delegate to others that portion of the work which he has omitted to learn, while retaining for himself the responsibility for the whole, along with the higher scale of reward which goes with that responsibility. You will, I think, recognise that this is the case of the medical man who, finding that bacteriological work is required for diagnosis and treatment, makes shift, without learning any bacteriology, to depute that work to others while retaining for himself the control of the case.

I have no doubt that you will adjudge the *first* of these forms of delegation to be both legitimate and necessary to

the carrying out of work on any large scale; that you will commend the *second* while recognising that it can only exceptionally be resorted to; and I believe that you will see that the *third* case is not very clearly distinguishable from the case of a layman who should undertake to treat a case on condition of his being permitted to consult by correspondence competent medical authority whenever he might see occasion for doing so. When I suggest that these cases are comparable, I do so because I want to put this issue before you. If we, as a profession, deprecate treatment by the unqualified on the ground of the dangers which may attach to the treatment of grave cases by the ignorant, can we then refrain from condemning, as perilous to the patient, the treatment of grave bacterial infections by those who are ignorant of bacteriology? And if we, as a profession, condemn consultation by correspondence on the ground that a trustworthy opinion cannot be based upon medical data which are furnished by an ignorant patient, how then shall we refrain from condemning the system by which a medical man who is ignorant of bacteriology selects the bacteriological data upon which a diagnosis is to be based?

I confess that I myself can find only one answer to that question. But let me assume that the question as to whether this kind of delegation is legitimate is still doubtful. There is then still another way by which we may arrive at a decision. Every tree is known by its fruits. We may therefore inquire into the practical working of the system. I would point out here—for we must judge everywhere by one and the same standard—that if we deprecate the treatment of cases by the unqualified on the ground that such treatment may sometimes be perilous to the patient, and if we condemn consultation by correspondence on the ground that this system would often work badly, we must, on the same basis, condemn the system by which the bacteriologically uninstructed delegate bacteriological work to the laboratories if this system is occasionally perilous to the patient and if it often works to his disadvantage.

I suppose that no one who has any experience of the practical working of this system of delegation has any doubt on this point. Every worker in such a laboratory could tell a tale of opportunities of diagnosis missed, of misdirected searches, and of quite incredible solecisms committed by distinguished clinicians whose qualifications date back to pre-bacteriological days. It is probable that every worker in a clinical laboratory has frequently been sent blood in a capillary tube with a request that it should be examined microscopically with a view to the detection of pathogenetic microbes. Or he has been sent a specimen of desiccated blood in a capsule with a request to examine for the malaria parasite. Or he has been asked to report on the opsonic index of a charred specimen of blood—the opsonic index being, in the view of the sender, a function which does not stand in need of any further qualification, and a function which is indestructible by heat. Or he has been asked to find the malaria bacillus in a specimen of urine, or has been sent a 24-hour specimen of urine from a case of septicæmia to make a vaccine for the treatment of the case. Or he has exhibited a preparation showing phagocytosis and has been asked by a high clinical authority to say which is the microbe and which is the phagocyte. In fact every bacteriological worker has been asked to place his services at the disposal of medical men who are in everything that appertains to bacteriology more uninstructed than the educated layman.

One ought perhaps here, you think, to accept as a counterpoise to the bad results which accrue from this system of delegation the good results which accrue from it in connexion with the diagnosis of diphtheria from swabs sent to the laboratory, and in connexion with the treatment of this disease by diphtheria antitoxin. I do not for one moment wish to overlook either these or the many other advantages which may have accrued from the establishment of laboratories for clinical bacteriology; but if I take these into consideration I am, by the same compulsion, obliged to take into consideration also that treatment by the unqualified and consultation by correspondence may also do good. And I put it to you that if we, as a profession, are under an obligation to call attention to the shortcomings of unqualified practice and consultation by correspondence, are we not under the same obligation to exercise censure upon ourselves when we have recourse to a system of delegation which involves us in similar shortcomings?

But let me deal with the suggestion that our present system of delegating bacteriological work, as exemplified in the case of the diagnosis and treatment of diphtheria, is an ideal system. I am very far, indeed, from taking this view of the matter. I regard our present system of dealing with the diagnosis and treatment of diphtheria as essentially defective. It is defective, first, in the respect that it takes into account only one bacteriological factor—the diphtheria bacillus—and one of its pathological effects—the intoxication by diphtheria toxin. It is defective, secondly, in the respect—and this defect attaches to nearly all our therapeutic efforts—that, instead of adapting itself to the particular requirements of the individual case, our present treatment of diphtheria aims only at securing a high average of successes. I hold it to be a great defect in our methods of diagnosis of diphtheria that attention is concentrated on the presence or absence of the diphtheria bacillus. We simply close our eyes to the fact that there may be associated with the diphtheria bacillus other pathogenetic microbes, such as streptococcus, whose presence may perhaps involve almost as much danger to life as the diphtheria bacillus itself. This neglect of the associated infections is only a natural outcome of the delegation of bacteriological work to bacteriologists who are out of touch with the case, and of the faulty appreciation of bacteriological data by medical men who are uninstructed in bacteriology.

Nor even if we leave entirely out of sight the question of therapeutics of the associated infections, and confine ourselves to the question of the therapeutics of the diphtheritic infection, would it be possible to applaud the policy of delegating the manufacture of the serum to a bacteriologist who is not in personal charge of diphtheria cases. For the laboratory bacteriologist almost by necessity sets himself, in the manufacture of serum, an ideal which is merely a laboratory ideal. He aims at the production of a serum which will conform to accepted laboratory tests and, in seeking to achieve the greatest possible antitoxic potency, he leaves out of sight the fact that a diphtheritic infection is something more than an intoxication by diphtheritic poison. In other words, he makes no provision to secure a serum which would promote the rapid casting off of the diphtheritic membrane and extermination of the diphtheria bacilli. So even in the case of diphtheria a policy of delegation, which absolves the clinician from all concern with bacteriology, and commits his work to the purely laboratory bacteriologist, would seem to be merely a policy of the second-best.

I.

LIMITATIONS OF VACCINE THERAPY.

And now I pass to deal with the subject which is set down for me. That subject is vaccine therapy: its administration, value, and limitations. Let me begin with the discussion of the limitations of the method. To the man who is not in sympathy with vaccine therapy the discussion of its limitations must be pre-eminently welcome, and to those of us who desire to see vaccine therapy employed whenever it can do good such discussion must be equally welcome. With a view to facilitating the consideration of this question, I have here set out in the form of a tabular statement certain salient points with reference to the limitations of vaccine therapy. I have, as you see, divided my table into two columns. In the first column I have set down a list of the objections which I have heard urged by pure clinicians. In the second column I have set forth the limitations which I myself, in common, I hope, with every bacteriological worker, would wish to insist upon:—

LIMITATIONS OF VACCINE THERAPY.

(*I.*) *Limitations as contended for by the clinician who regards vaccine therapy as an uncomfortable innovation.*	(*II.*) *Limitations as contended for by the bacteriological worker who looks forward to vaccine therapy being applied in conformity with scientific principle.*
1. Vaccine therapy finds no useful application except in connexion with furunculosis.	1. Vaccine therapy can be applied only where an exact and complete bacteriological diagnosis has been made, and where the diagnosis is kept up to date.
2. Vaccine therapy is of limited utility, because it can be applied only by those who have devoted study to bacteriology and immunisation.	2. Vaccine therapy can be applied only by those who have some acquaintance with bacteriology, some understanding of the rationale of vaccine therapy, and a knowledge of the dose of the particular vaccine which it is proposed to employ.

3. Vaccine therapy finds no useful application in connexion with the graver infections, such as pneumonia, rheumatic fever, typhoid fever, phthisis, meningitis, and streptococcal endocarditis.	3. A limit is placed to the efficacy of inoculations by the fact that there are definite limits to the responsive power of the patient.
4. The proper sphere of vaccine therapy is not to take the place of any surgical operation, but to supplement it.	4. Successful results can be obtained only where an efficient lymph stream can be conducted through the foci of infection.
5. Vaccine therapy finds no useful application in connexion with the ordinary infections of those regions of the body which fall within the sphere of the particular specialty that may happen to come under discussion.	5. In long-standing infections vaccine therapy can give definite results only after a long succession of inoculations, and there is no security against a relapse until the infection has been completely extinguished.
6. Vaccine therapy is of limited utility because it is applicable only to disorders which are referable to bacterial infection.	6. In a not inconsiderable percentage of cases it is essential to success that the dose of vaccine shall be controlled by measurements of the opsonic index.

LIMITATIONS AS CONTENDED FOR BY THE CLINICIAN.

When you have scanned the suggestions with regard to the limitations of vaccine therapy which are set out in column I. of the table above, you will, I think, recognise that we have in No. 1 the objection of the practitioner who shuts his eyes and ears to the facts until it becomes absolutely impossible any longer to do so. In Nos. 2, 3, 4, and 5, we have the usual objections of the general practitioner, consultant physician, operative surgeon, and specialist who desire to stand upon the old paths, and to be let alone. Lastly, we have in No. 6 the objection of the man who has no conception of the rôle which bacteria play in connexion with disease.

The contention that therapeutic inoculation has a useful application only in connexion with staphylococcus infections finds its exact parallel in the contention that prophylactic inoculation finds a useful application only in connexion with small-pox. We all now know that prophylactic inoculation has achieved brilliant results in man in connexion with typhoid fever and plague, and in animals in connexion with anthrax and many other diseases, and we infer from this that the principle of prophylactic inoculation is a principle of general application. In the same way we all know—all of us who care to know—that therapeutic inoculation is every day applied successfully in connexion with every kind of pathogenetic microbe. And we know also—and those of us who are actually at work on the question have realised this from the outset—that we have here a principle of general application.

We pass now to the contentions 2, 3, 4, and 5, to the contentions of those who urge that their particular spheres of practice cannot usefully be intruded upon by vaccine therapy; to the objection of the consultant physician that vaccine therapy has no useful application to any of the graver bacterial infections which he is called in to see; to the objection of the operating surgeon that vaccine therapy may never take the place of operative procedures; and to the objection of each several specialist that useful application cannot be found for vaccine therapy within the particular specialty which he himself practises. In reality there is no kind of necessity for combating these contentions. In so far as they are the outcome of hasty generalisations, and in so far as they are irrational and interested, they will crumble away of themselves; while in so far as they are based on reason and upon a real insight into facts of nature they will, of course, hold good. For the present I will content myself with pointing out that already vaccine therapy promises to be brilliantly successful in pneumonia; that it holds out promise in typhoid fever and in many forms of rheumatism; that it supplies the only ray of hope we have in endocarditis; that inoculation or a system of regulated auto-inoculation, such as Dr. Paterson has suggested and carried out at Frimley Sanatorium, is our only stand-by in phthisis; that it has already—pre-eminently in the case of tuberculous glands and many other forms of tuberculous infection—proved its superiority over operative procedures; and that it has given very favourable results in treatment of diseases of mouth, nose, ear, and genito-urinary system.

There remains to be considered objection No. 6—the objection that vaccine therapy is of limited utility because it is applicable only in disorders which are produced by microbial infection. While the world in general has progressed up to the point of accepting from the bacteriologist the fact that epidemic disease is due to microbial infection, the medical profession in general has not yet accepted it from the bacteriologist that we have in practically every disease a bacterial infection or the result of a bacterial infection. It is still comparatively unfamiliar matter that jaundice, bronchitis, common colds, many cases of asthma, infantile paralysis, and almost all cases of cardiac disease are one and all referable to microbial infection. And though it is made a reproach to the bacteriologist that he finds everywhere a bacterial infection, it is in reality the besetting sin of the bacteriologist to underrate, in common with every other man, the part played by microbes in disease; and he constantly has the mortification of finding that he has failed to appreciate the microbial factor in a disease, and has therefore misapprehended its nature. I would invite you to reflect in this connexion how few of us are prepared even to give a hearing to Metchnikoff when he urges that atheroma of the arteries may quite well be the result of an intoxication by bacterial products absorbed from the intestine, or to Mr. Arbuthnot Lane when he urges—as I understand him to do—that where the breasts and ovaries of the middle-aged woman are not regularly flushed through with blood in the hyperæmia of the sexual orgasm, they tend to undergo cystic degeneration under the influence of toxins absorbed from the intestinal canal. But perhaps I shall press home my point better if I tell you some of the awakenings that have only recently come to me, and if I show you how prone one is to be misled by tradition and nomenclature and to overlook everything that does not directly obtrude itself upon our senses. I may take these things in any order, just as they come to mind.

Formation of scar tissue.—It has been handed down to us as a dogma that where there has been very considerable loss of substance as the result of deep and extensive ulceration, or deep and extensive burns, the best result which one can look for is healing by scar tissue. I remember being wakened out of this belief by finding that very deep and extensive tuberculous ulcers may heal up under vaccine therapy with a complete *restitutio ad integrum*. In the first case I remember the ulcer was situated on the back of the hand. It was more than 2 inches in diameter, and it went down to the bone, and the *restitutio ad integrum* was here so complete that a year afterwards it was practically impossible to tell the hand which had been ulcerated from its fellow, and the patient, who, as a furrier, had to undertake very delicate manipulations, found his hand as flexible as before. The second case was that of a patient who has now for two years been one of our laboratory men. In his case a tuberculous ulcer which measured not less than 10 inches by 4 inches, and which extended from the ear to the point of the shoulder, and which was at one point so deep as to seem as if it must burst into the pharynx, has now for years been covered in with a soft white elastic skin which shows no sign of contraction and is not very different from normal skin. In would seem in view of these and other similar cases that it might perhaps be practicable to avoid the formation of scar tissue after burns by combating the supervening bacterial infections. We are trying to see what can be done on these lines.

X-ray dermatitis.—It will perhaps seem to you that only a man who was riding a hobby to death could suggest that a bacterial factor entered into the pathology of X-ray dermatitis. I will confess that it had never occurred to me that this might be the case until I was asked to see an X-ray operator whose hands were in a terrible condition with cracks and ulcers. Cultures here disclosed the fact that we had to deal with an extensive streptococcus infection, and the patient received great benefit from vaccine therapy, the intractable ulcers rapidly healing up as soon as the proper dose of his vaccine had been arrived at. I ask myself, in view of the burning quality of the pain in X-ray dermatitis, and the course that the disease runs, whether a streptococcus may not often be an important factor in this complaint.

Inflammatory trouble at the roots of the teeth and toothache.—It probably has not occurred to the ordinary man to connect trouble at the root of the teeth and toothache with a bacterial infection. But no sooner does one make an effort to shake off the disease of not thinking, and to sit down to reflect upon the subject, than it becomes clear that trouble at the roots of the teeth must be due to microbes finding their way down. And a very simple bacteriological observation

then suffices to show that we have in those cases where there is trouble at the roots of the teeth generally to deal with the ordinary streptococci of the mouth. We have, therefore, here a source of trouble which may quite well fall within the range of vaccine therapy; and as a matter of fact I have often seen such trouble quiet down under the influence of a vaccine. I would suggest here, as a point for investigation, whether the burning pain of actual toothache is not analogous to the burning pain of the streptococcus ulcer, and whether it may not be due to a quite similar infection.

Pruritus ani.—Pruritus ani is, again, one of those disorders which the ordinary man would not think of referring to a bacterial infection. At any rate, it had not occurred to me that it might be due to such an infection until a patient who was suffering from this condition was referred to me for the treatment of an associated furunculosis. I now find it difficult to understand how it is possible to look at pruritus ani from any other point of view than that of a bacterial infection. I have had under observation and treatment, in addition to the case just referred to, three very desperate cases of this affection. In each case I have found that a platinum loop applied to the seat of irritation brought away quite astonishing numbers of microbes, invariably staphylococcus and pseudo-diphtheria, and occasionaly tetragenus; and in each of these cases life has been rendered comfortable, or, if not quite comfortable, at any rate quite endurable, by the use of appropriate vaccines.

Hay fever.—Although the brilliant researches of Dunbar have put it beyond doubt that hay fever is to be traced to the toxic action of pollen, it would none the less seem possible that bacteria play a rôle in connexion with it. On the one hand, the consideration that the coryza which begins as hay fever may culminate in an asthma which may last for months after the season of pollen is over, and on the other hand, the fact that cultures made from the mucous membrane of the nose in hay fever often furnish voluminous growths of staphylococcus and bacillus septus and other organisms make it probable that the action of the pollen may pave the way for a microbial infection, and that this may seriously aggravate the disorder. If this is so, and if the exaggerated susceptibility to pollen which is the prime cause of the disease cannot be successfully overcome, bacterial vaccines may quite well prove useful in these cases.

Urinary calculus.—It is now perfectly well understood that the formation of biliary calculi stands in connexion with a coli infection of the biliary ducts and gall-bladder, and it has been known for very many years that phosphatic calculi form in the urine as the result of changes produced by bacteria. It is only going one single step further to search for a bacterial cause in connexion with every case of urinary calculus, and to try to identify the bacterial cause if such should exist. I have not undertaken any systematic observations along these lines, but, again, in the course of our daily routine of work a certain number of facts which all point in one direction have thrust themselves on my attention.

CASE 1.—A medical man who had suffered for years from a bacteriuria, which furnished in every case a pure culture of staphylococcus, developed a renal calculus and was operated upon.

CASE 2.—The daughter of a medical man who had undergone an operation for renal calculus which resulted in the removal of 21 oxalic acid calculi from the pelves of the kidneys, was brought to me with a view to something being done to prevent a recurrence of her troubles. A series of cultures made from her urine furnished in each case a copious growth of staphylococcus.

CASE 3.—A patient whose urine had for years furnished on each occasion a pure culture of a coliform bacillus, and who had undergone vaccine treatment for this, developed symptoms of renal calculus. The operation revealed the presence of a stone, and cultures made from the pelvis of the kidney furnished copious cultures of staphylococcus. A similar operation for calculus, undertaken 12 months later on the other kidney, again furnished a culture of staphylococcus.

CASE 4.—A patient who had been admitted to the inoculation wards at St. Mary's Hospital for the treatment of a deep and extensive ulceration caused by a combined syphilitic, streptococcal, and staphylococcal infection, developed symptoms of renal colic. Radiographic examination showed the presence of a stone in the pelvis of the right kidney and a similar calculus in the right ureter. An examination of his urine revealed the presence of staphylococci in fair numbers.

Indigestion, vomiting, flatulent distension of the stomach.—The fact that these are often prominent features in early phthisis is one of those facts which have been known so long that no one any longer asks for an explanation of them. I believe the answer to the problem may perhaps be found in the fact that pyorrhœa alveolaris is a frequent accompaniment of phthisis. I can hardly doubt, after what I have seen result from vaccine treatment in these cases, that the gastric disturbance must often be due to streptococci, swallowed with the food. I have, for instance, seen vomiting that had occurred regularly every day for six months disappear after the inoculation of a vaccine made from streptococci derived from the mouth. We must remember, in connexion with gastric disturbance which is associated with pyorrhœa, (1) that cooked food is for all practical purposes sterile food; (2) that the admixture of microbes which gives rise to fermentation can only come from the mouth or stomach; and (3) that inasmuch as a more or less effectual process of sterilisation takes place in the stomach, while the development of microbes goes on without such check in the mouth, the cause of the gastric fermentation is probably to be found in the microbes of the mouth which are swallowed with the food.

Epilepsy.—It would seem as if we had in epilepsy a condition which could not by any possibility stand in any etiological connexion with any bacterial infection. But even here the judicious will find ground for hesitancy. He will reflect that in infancy almost any infection which is associated with the setting free of bacterial toxins in the organism will produce convulsions. It may therefore not unreasonably be surmised that a bacterial focus which stood in connexion with the nervous system might even in the adult produce a like result. And I believe that I have seen epilepsy in tuberculous patients improve under inoculation treatment.

Cancer.—In spite of the fact that a moment's consideration would bring it home to anyone who had come into intimate contact with cancer that the microbic infections make a large part of the misery of the disease, both for the patient and for those that come in contact with him, the rôle which microbic infections play in connexion with cancer is as yet almost unrecognised. In reality that rôle is far more important than appears at first sight. Owing, no doubt, to that defective resistance which seems to be a feature of all neoplastic tissues, cancer, very early in its history, long before it has burrowed its way to the surface, becomes the seat of a staphylococcus infection—an infection by the so-called Micrococcus neoformans of Doyen. And there is reason to believe that much of the pain and swelling and inflammation in connexion with the tumour, and much, if not all, of the so-called cancerous cachexia, is due to this micro-organism. In view of this it is clear that, even though we cannot hope to strike at the root of the evil by anything in the nature of a vaccine treatment, cancer—and in particular, inoperable cancer—comes within the range of vaccine therapy.

Diabetes.—It must over and over again have suggested itself that diseases which are due to the faulty functioning of some organ—diseases, for instance, such as Graves's disease and pancreatic diabetes—may ultimately be traced to bacterial infection. Countenance is given to this suggestion by such work as has recently been done in connexion with the vaccine therapy of diabetes. I may refer to a case of pancreatic diabetes which was treated by my colleague, Captain S. R. Douglas, where the secretion of sugar and the symptoms of the patient were found to vary with the patient's resistance to a coliform bacillus which had been isolated from her fæces. I may refer also to the interesting facts which Dr. J. C. McWatters is bringing forward in this discussion in connexion with the treatment of glycosuria by staphylococcus vaccine. I think you will see that his facts suggest that glycosuria and carbuncle, which we have always supposed to be related as cause and effect, may perhaps in some cases be merely two different manifestations of a staphylococcus infection.

Enuria.—Finally, let me invite you to consider whether a bacterial infection may not in some cases turn out to be the cause of enuria. I can call to mind a case where enuria was apparently attributable to an unsuspected coli infection of the urine, and another case in which it was also associated with the same infection. Both cases yielded to treatment by vaccines.

I have, perhaps, said enough to rebut the contention that the range of vaccine therapy is restricted. In point of fact, it not only covers almost the whole range of our present medicine, but also much that lies altogether outside its borders. For it beseems every doctor to remember with humility that there are an infinitude of chronic or recurrent ills affecting mankind which are never seriously brought to his notice, because no one believes that there is any understanding of them in the medical profession, or any possibility of a cure being found for them. In this connexion I

may just glance at another point which, perhaps, more than any other, will bring home to you how extensive is the range which opens out before vaccine therapy. It is certain that we come into this world each with his individual susceptibility to microbic invasion. I am here thinking not of our susceptibility to those microbes which can pass from man to man in the form of epidemics—those microbes which alone come into the field of view of the hygienist. I am thinking rather of the fact that one man is by nature deficient in his resisting power to the staphylococcus, another to the pneumococcus, another to the bacillus of Friedländer, another to the influenza bacillus or to the acne bacillus, another again to some one of the different forms of streptococcus, or of the pseudo-diphtheria bacillus or of the coli bacillus, and another to the tubercle bacillus. And I would have you reflect, in connexion with these microbes, that while their ravages may not be dramatic, they are collectively responsible for nine-tenths of human disease. And then I would have you reflect that while man makes efforts to guard himself against epidemic disease, and while he enlists the help of the State in this task, he accepts it as if it were an unalterable law of nature that he should be buffeted throughout his life by the particular microbe to which he individually is liable. Thus one man puts up with recurrent influenzal attacks, another man with a succession of sore-throats, another man with continual recurrences of boils, another man with chronic bronchitis, another with perpetual trouble in the roots of his teeth, another with a continuous discharge from the ear, another with sycosis or acne, another with the coli infection of the urine, another with continual pruritus, another with tubercular glands, another with phthisis, another with recurrent intestinal attacks, and so on through the whole gamut. Vaccine therapy will, I believe, help every man to keep under the particular microbe which besets him.

LIMITATIONS AS CONTENDED FOR BY THE BACTERIOLOGIST.

I now pass to consider Column II. of my table; in other words, to consider the limitations of vaccine therapy, which must—if I see the matter aright—be contended for by every bacteriological worker who desires to see vaccine therapy applied in conformity with scientific principles. I think that only the first and the last two of the contentions in Column II. stand in need of anything in the way of amplification and defence. There is no one I conceive who would think of questioning that a complete and exact diagnosis is a necessary preliminary to a successful application of vaccine therapy. Nor will anyone who has done work on a case of mixed infection have any doubt as to the absolute necessity of keeping the diagnosis up to date. It must none the less be emphasised that as soon as ever a definite label has been placed upon a case, that label generally dismisses from view all further bacteriological possibilities.

The risk of accepting an incomplete for a complete diagnosis, and so imperilling the success of our treatment, is perhaps most conspicuous in connexion with syphilitic and tubercular infections. And yet in many cases the very clinical characters which serve as stigmata of tubercular or syphilitic infection are characters which ought properly to go down to the account of other microbes; and when we go into the matter it becomes clear that it is the presence of these microbes in the lesion which puts the clinician on the trail and furnishes him with the logical justification for the diagnosis of syphilis or tubercle. A typical instance is furnished by rupia. The characteristic rupial scab testifies to the presence of a bacterial agent which induces a copious transudation of lymph. The bacterial agent which has a pre-eminent power of doing this is the streptococcus. But in the case of a typical pure streptococcal infection the exudate is wont to be a perfectly clear lymph which sets into an amber yellow scab which crumbles down into a powder like gum arabic. In rupia, however, the discharge is semi-purulent, and the heaped-up scab which suggests the idea of a streptococcus infection is very tough and opaque. It is, in fact, a scab that contains a large admixture of leucocytes. This suggests a superadded infection, and the commonest infective agent which leads to an emigration of leucocytes is the staphylococcus. The characters of the rupial scab thus furnish presumptive proof of the presence of streptococcus and staphylococcus—in reality both these are regularly to be found in rupia—and, little as the pure clinician appreciates the fact, it is this twofold infection which leads him to the diagnosis of syphilis. For we have apparently in the spirochæte a microbe which brings about a general lowering of the resistance of the body to microbic infection. I may say, in passing, that the inference that a multiple infection such as we have in rupia is *always* due to syphilis is not always correct.

It is, however, certain that there is no tubercular or syphilitic ulceration of a mucous membrane, and no extensive tubercular or syphilitic ulceration of the skin, which is not complicated by secondary infections. It follows that it is improper in any case of tubercular ulceration of the larynx or tongue to depend entirely upon tuberculin and to overlook the associated infections. Similarly, it is important, in any connexion with syphilitic ulceration to keep in mind the possibility that chemotherapy may be ineffective if we do not turn our attention to the associated microbes. And in such cases it often does not suffice to combat only one variety of associated microbes. One comes across case after case where, owing to the fact that one of a batch of infecting microbes has been overlooked, a wound obstinately refuses to get well. I have, for instance, in mind a case of tuberculous ulceration of the chin which failed to make progress when treated with a combination of tubercle and staphylococcus vaccine, and which healed up rapidly when, after the discovery of a streptococcus in the wound, a combination of tubercle, staphylococcus, and streptococcus vaccine was employed. The subsequent history of this case is interesting also as showing the necessity of keeping the diagnosis up to date. When some months after the patient had gone back to the country the ulceration broke out again, the same triple combination proved quite ineffective. The ulceration spread in an alarming manner, and the patient returned to hospital for treatment. It was then found that the bacillus proteus had established itself in the wound, and that his blood gave a positive reaction with Wassermann's test. A proteus vaccine was now administered, and under the influence of this, in combination with a few doses of iodide of potassium, the wound healed up rapidly.

The fact that long-standing infections cannot be got under save by a long succession of inoculations is obvious to anyone who understands anything of the rationale of vaccine therapy. I, however, specially emphasise it here because I find that the most unreasonable expectations are afloat as to what may legitimately be expected from vaccine therapy. In view of these, I must try to make it clear what we can and what we cannot hope from the method in a case of long-standing infection. Perhaps the easiest way of bringing home some appreciation of the conditions is to compare the human body to a garden, the vaccine-therapist to the gardener, and the pathogenetic microbes to weeds which can be thinned out, but which, so long as any of them remain over, retain their power of multiplying and regaining lost ground. This analogy makes it plain that the most that can be achieved in a long-standing infection by one dose of a vaccine is a temporary reduction in the number of the infecting microbes, and that it is not worth while, in such a case, to embark upon anything less than a systematic campaign. And it also makes it plain why it should be necessary to inoculate again and again for an unlimited time when a vaccine is employed for therapeutic purposes, and once or twice only where it is employed for prophylaxis. Clearly where inoculation is resorted to for therapeutic purposes the surplus of anti bacterial substances, which is elaborated, is immediately expended in the destruction of microbes; where inoculation is resorted to for prophylaxis, such surplus is not used up, but is kept in reserve against future eventualities. When a patient is informed of these facts, and when he is told that it will be necessary to inoculate again and again for an unlimited time, he will inevitably ask how long it will take to accomplish a *cure*. It will be profitable, therefore, to clarify our ideas about this question of the achievement of a cure.

Bacterial infections fall in reality into two classes. (*a*) Into the first class would fall "surface infections" by microbes which are normally saprophytic on the affected surfaces. The pneumococcal or streptococcal infections, which are the commonest causes of bronchitis, are instances in point. In this class of infection it is unreasonable to aim at a complete extinction of the infecting microbe. What we can here hope for in the way of a cure is to keep the number

of microbes within bounds, and to minimise the chance of a recrudescence by keeping the patient's resisting power up to the mark. (*b*) Into the second class would fall infections by microbes which are extraneous to the normal organism, which are always pathogenetic, and which can only be acquired by infection from the sick. Tubercular infections are instances in point. In this class of cases the extinction of the infection is quite a reasonable ideal. But if now, in connexion with this class of infections, the question is pressed as to how soon this can be achieved, the vaccine therapist is bound to reply that he can never say beforehand, and can never guarantee the attainment of this result. But, though he cannot prophesy, he can from time to time take stock of the patient's condition, and tell him whether or no he has made progress, and whether or no the infection has been extinguished.

In reality, we have in addition to the clinical condition—which, of course, cannot tell us whether an infection has been extinguished—not less than four different methods by which we may see how we have progressed. Let me explain what these are:—

1. In the case where the patient's index is being regularly taken, let us say at the expiration of ten days after inoculation, we have an automatic check upon the progress of the case. For if we find that, instead of sinking rapidly away to below normal, as it did at the outset, the opsonic index now maintains itself at the level of the normal, or a somewhat higher level, we may—if we have excluded the fallacy of auto-inoculation—confidently conclude that the patient is making good progress. For clearly as the pathogenetic microbes in the body diminish, there must be a proportionately slower expenditure of anti-bacterial substances. When we have satisfied ourselves that this is the case, and if also all the overt signs of infection have disappeared, we may proceed cautiously to apply the next test.

2. Where we have reason to believe that the infection may have been extinguished, and want to make certain that this is really the case, we may tentatively give up the inoculations but continue to make measurements of the opsonic index. And if, under these circumstances, we still find the opsonic index remaining normal month after month, we may conclude that the drain upon the patient's anti-bacterial resources—it is probably that drain which accounts for the subnormal indices found in the early stages of tuberculin infection—has been arrested. This will signify the complete, or all but complete, extinction of the infection. A table showing the results obtained by this method of testing on a series of patients is subjoined.

If we desire an even more searching test we may take either the next or the one following.

3. This test is based upon the consideration that if we send a lymph stream through a limb or any other region of the body which has been the seat of a bacterial invasion, that lymph stream will, as it returns to the blood, carry bacterial poisons back into the blood, with a result that a characteristic fluctuation will occur in the opsonic power of the blood. This test furnishes information which is specially valuable where the decision of the question as to whether the patient may use his limb depends upon the question of the extinction of the infection in a joint. For the purpose of this test active hyperæmia is induced in the suspected focus of infection, a bandage is then applied to the vein in such a way as to obstruct the blood current, and when a transudation of lymph has in this manner been obtained the lymph is driven back into the circulation by massage or active movements. In order that the test may yield conclusive results, it is advisable, in cases where there can be only very little remaining infection, to keep the limb at rest for a day or two before undertaking the test, in order to allow of an accumulation of bacterial toxins in the focus. (Chart I.)

(4) While the test which has just been described resolves the question as to whether there is still lurking infection in a suspected focus, consideration will show that it will not resolve the question as to whether there may not be elsewhere in the patient's body an unextinguished focus. If this question should not be held to be sufficiently resolved by such a series of tests as is described under (2), it can be further put to the proof by testing the patient's blood before and after severe exercise. The routine procedure which we employ in such a case is to test four samples of the patient's blood—the first drawn off immediately before exercise, the second immediately after, the third six hours after, and the fourth 24 hours after. A pair of companion charts showing the results obtained by this method of testing is subjoined. (Chart II.)

THE RELATION OF THE OPSONIC INDEX TO INOCULATION.

The only one of the contentions in Column II. which is in any sense of the word controversial is the contention that it is not infrequently essential to success that the doses of vaccine shall be controlled by measurements of the opsonic index. We have in this connexion to consider, first, the question as to whether the opsonic power of the blood can be accurately measured; secondly, the question as to whether there is a correlation between the rise and fall of the opsonic

Table of Cases in which the Infection is Inferred to be Extinct from the Maintenance of a Normal Opsonic Level, and in which Confirmation of this Inference has been Afforded by the Fact that the Patients have Remained Quite Free from all Signs of Infection.

Case initials.	Nature of tubercular infection.	Length of treatment up to complete disappearance of all evidence of infection.	Measurements of opsonic index undertaken after cessation of treatment. Months.										
			1	2	3	4	5	6	7-8	9-12	13-16	17-20	21-24
A. H.	Extensive ulceration of skin and subcutaneous tissues	3 months.	—	·86	—	—	—	1·06	—	·93	—	—	—
F. M.	Peritonitis	39 ,,	1·13	—	·96	·91	—	—	1·05	1·05	—	—	—
M. B.	Adenitis	6 ,,	1·11	—	·98	·94	·94	—	*·84 1·07	—	—	—	—
W. C. P.	Cystitis	5 ,,	1·17	—	—	·88	†·69 ·96 ·88	—	—	—	1·13	—	—
G. E. G.	Epididymitis	2 ,,	·96	—	—	—	—	—	1·02	—	—	—	—
W. M. P.	Tubercular mass in vitreous	23 ,,	—	—	—	—	—	1·01	—	·96	—	—	—
B. P.	Adenitis	11 ,,	1·13	—	1·30	1·06	—	1·15	—	—	·96	1·12	—
L.	Ulceration of hand	7 ,,	1·18	—	·94	—	1·00	—	—	·86	1·04	—	1·20
G.	Adenitis	14 ,,	—	·83	—	·94	—	1·12	—	—	—	—	—
R. M.	Arthritis of knee	25 ,,	1·17	—	·98	—	1·06	—	1·11	—	1·14	1·19	—
R. W.	Adenitis	9 ,,	·80	—	·97	—	·96	—	·87	—	1·05	—	—
W. S.	Arthritis of knee	34 ,,	1·00	·93	·92	—	—	—	1·04	—	—	—	—
G. L.	Adenitis	22 ,,	1·12	—	—	1·18	·93	—	·84	1·07	—	—	—
G. M.	Arthritis of knee	13 ,,	1·21 1·08	1·07	1·02	—	—	—	—	—	—	—	—
G. S.	Adenitis	21 ,,	·92	—	—	1·28	—	—	·90 1·24	1·37	1·11	1·04	—

* Patient suffering from a temporary indisposition. † There is a doubt as to the accuracy of this estimation, as the patient was in perfect health, and the blood, when tested three days later, gave an index of ·96.

index and improvement and aggravation in the condition of the patient; and, thirdly, the question whether the measurement of the opsonic index can be dispensed with, and whether any other guide can take its place.

(i) *Question as to whether the Opsonic Power of the Blood can be Accurately Measured.*

I may point out, *in limine*, that the controversy which has taken place on the subject of the accuracy of the opsonic index is only what might have been expected, seeing that it is in connexion with the measurement of the opsonic index that the capacity of bacteriological workers for accurate quantitative work has for the first time been seriously put to the test.

I may very briefly refer here to three schools of criticism.

CHART I.

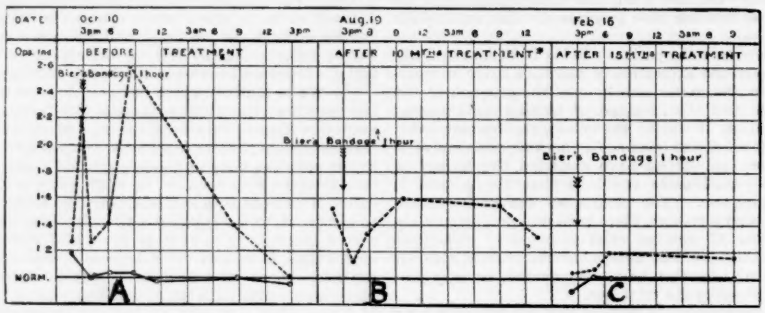
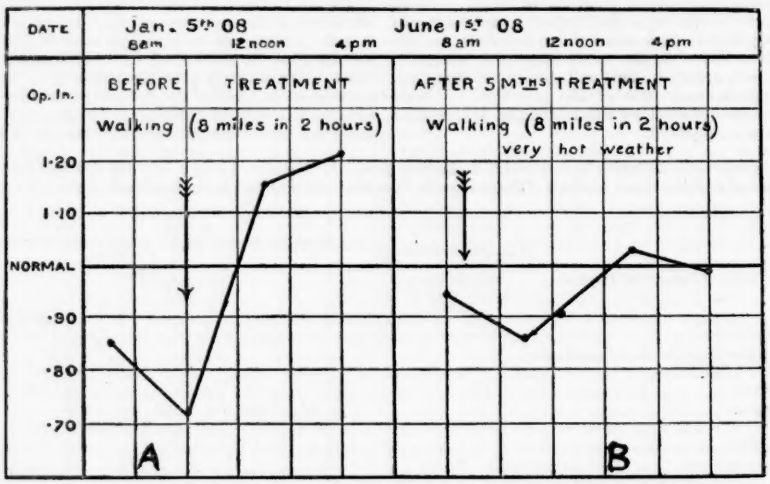


Chart showing results of auto-inoculation tests carried out in a case of gonococcal arthritis of wrist. A, before treatment; B, after 10 months' treatment with gonococcus vaccine; C, after 16 months' vaccine treatment. - - - - = Gono-opsonic index. —— = Tuberculo-opsonic index.

CHART II.



G. D. O. Phthisis. Auto-inoculation tests carried out A before treatment, B after 5 months' treatment.

The first, represented by Pigg-Strangeways and his collaborators, asserted that differences such as emerge in connexion with the counting of phagocytic preparations of different bloods might quite well be due to the operations of chance, which brought into the field of view of the observer in one specimen of blood a group of leucocytes which happened by chance to contain more microbes, and in the other specimen of blood a group of leucocytes which happened to contain less microbes. These critics further suggested that if a sufficient number of leucocytes—1000 leucocytes was the proposed number—were counted, it might be found that there was never any difference between tubercular and non-tubercular bloods.

A second school of criticism declared that, while there could be no question but that there were often marked differences between the blood of infected patients and normal blood, the margin of error in the method is so considerable as to deprive it of any practical value. In support of this thesis some observers brought forward discordant results obtained by themselves on duplicate samples of blood. Other critics brought forward discordant results obtained by a series of observers in different laboratories who were all supplied with the same bloods. In connexion with the last-mentioned results it is to be observed that in tests thus organised the results of inaccurate workers throw doubt upon the work of accurate workers. Moreover, as I have already elsewhere[1] pointed out, results obtained in different laboratories with different strains of microbes are not, and cannot be expected to be, comparable *inter se*.

A third school of criticism proclaimed that, inasmuch as the average ingest of a certain number of leucocytes is taken to represent the opsonic power of a blood, there here enters into the method a certain factor of chance—a factor whose magnitude can be calculated only by a statistician. Again, this school of criticism contends that, inasmuch as the phagocytic power of the individual leucocyte varies within certain limits, there here enters again into the method another factor of chance which also is a proper subject-matter for mathematical evaluation. On this basis the statistician puts forward a claim to determine the limit of error of the opsonic method. In reality, however, in

[1] Studies on Immunisation (Constable, London), p. 450.

addition to the two factors which have come within his purview, there are many others which have an important influence on the result.

In the first place, the range of variation in the phagocytic power of the leucocytes, which is by the statistician assumed to be a constant, is in reality a factor which is profoundly modified by the treatment to which the leucocytes are subjected. While we have in some cases a comparatively small range of variation, in cases where the leucocytes have been maltreated we have a much larger range. Again, though the statistician assumes that a record of bacteria counted in a series of leucocytes is as unambiguous and as little open to error as, let us say, a record of pips counted on a series of cards, this is very far from being so. Microbes cannot be satisfactorily counted unless the leucocyte has first been spread out flat as a card. Again, the microbes must have been differentially stained so as to stand out perfectly clear against the background of the leucocyte. Again, the bacteria must not be fragmented or gathered together into groups. They must not be so numerous as to make accurate counting difficult. And there is also another requirement; the observer must bring to the task of counting exceptional concentration, and he must display no little judgment in the avoidance of pitfalls and fallacies. It follows that the figures which represent the number of bacteria counted in the individual leucocyte are affected by the treatment to which these have been subjected *in vitro*, and these figures are also affected by the degree of skill and attention which has been brought to bear upon the preparation of the bacterial suspension, the spreading of the blood film, the fixing and staining of the preparation, and the counting. Figures which are the resultant of all these factors, which are personal to the individual worker, cannot, I submit, possibly furnish a "*mathematical limit of error*" for a method. What they may perhaps furnish is a value for the "mathematical limit of error" in combination with what I may perhaps call the "*functional error*" of the observer, or groups of observers, whose work is under review.

Let me try to make clear to you—in so doing I shall only be elaborating what is familiar matter to us all—the importance of the "*functional error*" in connexion with our work. The "*limit of error of a method*" is, if I understand the expression aright, a function which can attach only to quantitative methods in which we have an inherent factor of chance. It is a value which is unalterably fixed by mathematical laws, which can be arrived at only by a mathematician. It is a value which is exactly the same for every worker. No one can emancipate himself from it, or do anything to diminish it; and it is indissolubly attached to the *method*. The "*functional error*" is an error which attaches only to methods which involve a certain amount of skilful functioning. It attaches to the *operator*. It has a different value for every operator. It may in the case of one and the same operator vary from hour to hour with his physiological efficiency. Its value can be diminished by practice and attention. It cannot be evaluated by a mathematician. It can be pretty accurately gauged by the operator. The "*working error*" corresponds sometimes to "the limit of error of the method," sometimes to the "functional error of the operator," and sometimes to the sum of these values.

In the case of such an exercise as counting of the number of pips on a series of cards and taking the average of these, or in going through the same operations with a series of throws of the dice, nothing in the nature of skilful functioning is required. The "functional error" is therefore here negligible; and the "working error" may be identified with the "limit of error of the method." In such a case as the auscultation and percussion of a chest, or in billiards, the whole "working error" is the "functional error of the operator." In the case of the measurement of the opsonic index "the working error" is the sum of "the limit of error of the method" and "the functional error of the operator." Of these, by far the most important factor is the "functional error." I have satisfied myself, and all my fellow workers have satisfied themselves, and I am glad to say a very large and increasing number of bacteriological workers all over the world have satisfied themselves, that when the "functional error" has been reduced, as it can be by practice and patience, to small dimensions, and when, in connexion with tubercle, the customary counts of 100 or more leucocytes are made, the "mathematical limit of error" of the opsonic index is such as need not seriously be taken into account. In view of this I suggest that those critics who have put forward figures showing enormous working errors in opsonic estimations may have supplied to the world data with regard to the magnitude of their own functional errors, instead of—as self-esteem assured them—data with regard to errors inherent in the opsonic method.

(ii.) *Questions as to whether the Rise and Fall of the Opsonic Power of the Blood is Correlated with Improvement and Aggravation in the Condition of the Patient.*

I have elsewhere[2] discussed at some length the questions as to whether it is a practical ideal to make a *complete evaluation* of all the factors which make up the resisting power of the organism to bacterial invasion. I have pointed out there that inasmuch as it would be necessary for a complete evaluation of the antibacterial power of the organism to enumerate all the leucocytes, to measure their individual phagocytic activity—and, I may add, their power of digesting the ingested microbes—and to consider the question as to how far the leucocytes which are available could be brought into application; and, further, inasmuch as it would be necessary for a complete evaluation to evaluate all the known antibacterial elements which may affect the microbe from which the patient is suffering, and to make allowance for all the antibacterial elements which have not yet been discovered; and, lastly, inasmuch as there is no common denominator to which we can refer these different classes of defensive elements so as to add the one to the other or to set off the one against the other, it must for ever be impracticable to make a complete evaluation of the antibacterial forces of the body. And I have pointed out[3] that it is for these reasons absolutely necessary—if we are to have any direct guide in our immunisation proceedings—to content ourselves with a confessedly *partial evaluation* of the antibacterial powers of the blood. Again, I have pointed out that we can quite well turn to account a partial evaluation if the antibacterial element which has been selected for measurement is an element which can be accurately measured, which decreases and diminishes in the blood in response to inoculations of vaccine, and which increases and diminishes in correlation with the clinical condition.

The measurement of the opsonic power of the blood is *confessedly* and *in intention* a partial evaluation of the antibacterial defences of the body; it can be accurately measured, it is an element which decreases and diminishes in the blood in response to inoculations of vaccine; and the question for discussion is whether it increases and diminishes in correlation with the patient's clinical condition. I have affirmed that there is such correlation. If anyone desires proof of this, he has only to watch the effect which is produced on the clinical condition and the opsonic power of a tuberculous patient by an excessive dose of tuberculin or an excessive auto-inoculation. Or if he wants to see that a rise in the opsonic index is correlated with an improvement in the patient's condition, he has only to take a tuberculous patient who has a chronically low index and watch the improvement that goes hand in hand with an improvement in the index. Or if he wants to watch the way in which the clinical condition varies with the opsonic index, he has only, in a tuberculous person, to inoculate somewhat smaller doses than are required, and he will see the patient's condition improve and his opsonic index increase for a few days after inoculation, and then regularly fall away again before the next inoculation is undertaken. I have hitherto always emphasised this generalisation and said little about the exceptions, *first*, because in every new scientific departure our business is with the rule and not with the exception; and, *secondly*, because when it has once been stated that a measurement of the opsonic power of the blood is confessedly and in intention a partial evaluation of the antibacterial defences of the body, that statement inevitably brings it home to the thoughtful that there cannot then by any possibility be a perfect correlation between the opsonic power and the clinical condition.

I leave the matter there for your consideration. I would, however, point out to you that the difficult thing in this intricate web of things in which we are entangled is to possess ourselves of the broad generalisations. It is no difficult task to alight upon an exception to a generalisation which confessedly gives only the general rule. The man who, meeting an exception which might have been foreseen, straightway throws up the sponge is like the man "who encountered a corpse and retreated to bed, announcing that

[2] Ibid., pp. 331-53. [3] Ibid., p. 334.

all life was contradicted." I suppose that not even the correlation that exists between the readings of the clinical thermometer and the condition of a patient is to be accounted a perfect correlation.

(iii.) *Question as to whether the Measurement of the Opsonic Index can be Dispensed with, and whether there is any other Guide which can take its Place.*

I have already elsewhere [4]—weighing my words very carefully as I did so—said practically everything I have to say on the question of the importance of controlling the dosage by measurements of the opsonic index. I pointed out there that in a large class of cases it is impossible within the short interval which normally elapses between one inoculation and another to tell by any clinical observation whether the preceding dose of vaccine has elicited a satisfactory immunising response. We have in chronic tubercular infections typical examples of this class of case, and there are also many obstinate cases of infection by other micro-organisms—cases of empyema, sinusitis, middle-ear disease, urinary infections, streptococcal infections of bone, &c.—where a definite clinical improvement can be hoped for only after a consecutive series of effective inoculations. In all these cases we have either to work entirely without a guide or to rely upon the opsonic index as our guide. I have also emphasised that even where we have more or less definite clinical symptoms to guide us at the outset there will, if the patient improves, inevitably come a time where the clinical symptoms will fail us as a guide, but where the inoculations ought to be continued for the purpose of extinguishing the infection. Here, again, the opsonic index is our only possible guide. And we cannot dispense with it if we are to diagnose our obscure cases, to take accurate stock of the progress of our cases, and to satisfy ourselves that we have extinguished the infection and that we may suspend our inoculations.

If any of these statements are controvertible, it would be well that they should now be controverted. For, up to the present, what I have urged in favour of the importance of controlling dosage by the opsonic index has been met only by insistence that the correlation between the opsonic index and the clinical condition is not a perfect one—if this were a reason for dispensing with the opsonic index, it would also be a reason to dispense with the thermometer—and by the iteration of the formula that the clinical signs give to the clinician sufficient guide in the regulation of his doses. When I find a speaker obsessed with this formula; when I find him ignoring the fact that there are cases where no guidance can be obtained from the clinical symptoms; when I find that he refuses to face the problem as to how in such cases the dose of vaccine is to be regulated; when I find him citing cases which he has inoculated with success under the guidance of definite clinical symptoms, and adducing these as proof that the opsonic index can be dispensed with in cases where guidance cannot be obtained from the symptoms, I ask myself whether I am not perhaps listening to "one of those sages whom a man should understand less as he heard him longer." While I have insisted, and continue to insist, that there are many cases where we are not doing the best for the patient if we are not controlling the effect of our inoculations by the opsonic index, I have from the very outset recognised that vaccine therapy can in many cases be carried out with success without its aid. I recognise that more fully every day, and I rejoice, with all those who understand what vaccine therapy may mean to the world, that it should be so.

Let me briefly describe to you what our practice is in connexion with the control of inoculation by the opsonic index in the case of the out-patients and in-patients in the Inoculation Department of St. Mary's Hospital. In an ordinary case of localised streptococcus or staphylococcus infection we practically never have recourse to the opsonic index. In connexion with these infections we know the appropriate doses of vaccine, and the clinical symptoms furnish any further guide that may be required. The same holds true of acne. It holds true again of croupous pneumonia. Where we have to deal with a case of staphylococcus infection, such as sycosis, which has obtained a firm hold upon the patient and which offers considerable resistance to the treatment, and which we can only hope to overcome by a succession of effective inoculations, it is often necessary to regulate the dose by means of estimations of the opsonic index. The same holds true of the very chronic streptococcus infections which are associated with tubercular disease of bone. It holds true again of the chronic coliform infections.

In the cases of tubercular infection we make a distinction. We make it a practice in every case of phthisis to control the effects of the inoculations by the opsonic index, but employing, as we do in the case of phthisical out-patients, only doses which give no negative phases, we find it sufficient to determine by blood examination, undertaken on the day before the patient returns for inoculation, whether the dose has been adequate to keep the opsonic index up to the normal. In the case of phthisical patients who are treated in the wards more frequent examinations are undertaken. In the case of tubercular adenitis and other localised forms of tubercular infection we limit our opsonic examinations if satisfactory progress is being made. As a rule, we undertake these only where the question of increasing the dose presents itself. In cases which do not make such satisfactory progress the opsonic index is estimated much more frequently. In cases of septicæmia and in cases of advanced phthisis, and, in short, all cases where the condition of the patient is undergoing constant and rapid changes under the influence of continuous auto-inoculations, we find that the measurement of the opsonic index does not render any very valuable services.

In conclusion, I may mention, in connexion with the question as to whether the temperature in a pyrexic case can be taken as a guide to the opsonic index, that we have over and over again verified that, except in those unfortunately more or less rare cases where a pyrexic infection is being definitely got under by inoculation, we do not find any of that inverse correlation of temperature to the opsonic index which is illustrated in some of our published charts [5] and which Dr. Latham, generalising apparently from a very few cases, has alleged to constitute the general rule. The temperature cannot therefore be depended upon as a guide in immunization.

I pass on from the consideration of the limitations of vaccine therapy to its results.

II.

VALUE OF VACCINE THERAPY.

It would clearly be an impossible task to attempt here even a summary of the results of vaccine therapy. All that I would propose to do is to suggest for your consideration certain general canons of criticism which ought, I think, to be kept in view when we set ourselves to appraise the results of any therapeutic procedure. The question as to how we are to give our verdict upon the success or failure of vaccine therapy in the individual case ought obviously to take precedence over the question as to how, when we have passed our verdict upon the success or failure of vaccine therapy in a series of cases, we can bring these separate verdicts together into the form of a general verdict. Let me then begin with the former of these questions. Now I would put it to you that we have in connexion with vaccine therapy to consider two entirely different classes of cases.

We have, first, the simple and unambiguous case. This is the case where the treatment consists of a single inoculation of vaccine, and where the verdict takes into account only the results of that one inoculation. We may take as an example the case in which the vaccine therapist sets himself the task of aborting a stye on the eye or of arresting a streptococcus infection in a "poisoned wound." To abort the stye and to stop the streptococcus infection promptly is to succeed—for these things do not happen of themselves; to do less than this is to fail. The game consists here in the winning of one trick, and there cannot be two opinions as to whether that trick has been won or lost.

We come now to the more intricate case. This is the case where the treatment comprises a whole series of inoculations, and where what has to be adjudicated upon is the success or failure of the whole series of operations. Consideration shows that the conditions which here present themselves may be compared with a game which consists in winning not, as in the case last considered, a single trick, but a whole series of tricks. Among the problems which here present themselves there is again a simpler and a more difficult one.

Let us begin with the former. It is clear that if the

[4] Ibid., pp. 434-9.

[5] Ibid., pp. 404 and 407.

patient gets steadily worse under inoculation the case must be counted as a failure to vaccine therapy. And if the case gets steadily better and has ended in the extinction of the infection, it must be classed as a success to vaccine therapy, *if* it is conceded that the case offered no prospect of a spontaneous cure. If that is not conceded the case becomes, for those who have either a bias in favour of or a bias against vaccine therapy, a case for wrangling over. For the judicious and unbiased person it becomes a case which is to be set down as a more or less probable success for vaccine therapy. In other words, if the game is won it may be a matter of dispute whether it is the vaccine therapist who has won the tricks, and the dispassionate man will decide on the probabilities.

I pass to the really difficult cases. We have such a case where the vaccine therapist begins by winning a series of tricks and then begins to lose, and the game is broken off. We have again such a case where the vaccine therapist wins a series of tricks and it is assumed that this wins the game, and then the game is broken off, and then, after abandonment of treatment, there comes a relapse. And we have again such a case where the game is never definitely won, but where the vaccine therapist re-inoculates whenever the condition of the patient requires it, and each time temporarily ameliorates matters. In these cases the judgments that are passed are often absolutely reckless. It is here that the man who is blinded by a bias in favour of inoculation claims credit for winning the whole game when he has won only a very few tricks. It is here that the man who is blinded by a bias against inoculation contends that the game has been lost when only one trick or a very few tricks have been lost.

I will leave it to others to illustrate the effects of the bias in favour of inoculation. I think the following verdicts will illustrate the effects of the bias against inoculation. They relate to cases which were treated by me, which then passed out of my hands into the hands of others, furnishing to them material for controversial uses. The first was a case of tubercular epididymitis. An eminent surgeon had arranged to operate in this case, and the day had been fixed. On the advent of that day he, however, found that the disease had progressed so rapidly that the operation had to be abandoned. The patient was then referred to me for treatment by vaccine therapy. For a long time the patient made very satisfactory improvement under vaccine therapy. He then lost ground. If I remember aright, the epididymis began to break down. He then went back to the surgeon, and the operation for amputation of the testicle, which had before been abandoned, was undertaken. The case was then controversially cited as an example of the failure of vaccine therapy. I do not demur. I merely point out that this was a case where, in the language of my metaphor, I had won a series of tricks; I then began to lose, and the fact that I had failed to bring about a cure was the only fact which was taken into account. But if I appreciate the case aright, the success which attended vaccine therapy had made it possible to undertake the operation with a prospect of success. I ask myself what would be the verdict of the judicious upon such a case. Would *he* pronounce it a failure or a success?

The second case was that of a patient who had been suffering for several months from a chronic œdematous inflammation of the pharynx and soft palate, which had been treated unsuccessfully by an eminent laryngologist. I was asked to see the patient, and found that the cause of the trouble was a mixed pneumococcus and catarrhalis infection. A striking improvement manifested itself immediately after the inoculation of the first dose of vaccine. The patient was easier and the œdema and cyanosis of the affected parts had markedly diminished. A few days later, however, a small perforating ulcer made its appearance in the central line of the soft palate, and inoculation-treatment was discontinued. The case was published by the laryngologist who had been in charge of the case as a failure for vaccine therapy. Again, I ask myself what the verdict of the judicious would be. It would perhaps have been that one trick had been won by vaccine therapy, or perhaps—in view of the development of the ulcer—that one trick had been lost. But I think the decision would not have been that the game had been played to a finish and that vaccine therapy had proved a failure.

The third case was that of a patient with fairly advanced phthisis who was treated as an out-patient in the Inoculation Department of St. Mary's Hospital. Considering the fact that she was a frail little woman and had a very considerable distance to come for treatment, this patient had, we thought, made very fair progress under vaccine therapy; and she, of course, assured us that she had. Some time in the late autumn of last year she fell seriously ill, discontinued her attendance, and saw in consultation with her medical attendant an eminent physician. By his advice she was placed upon continuous inhalations of an antiseptic. A letter published by her medical attendant in one of the medical journals early in this year recounts the brilliant success of this method and the failure of vaccine therapy. Only two or three days ago that patient was admitted to St. Mary's suffering from pneumothorax and in a very serious condition. I do not know what the commentary of the judicious would be upon this. He might, of course, decide that the case was a success for vaccine therapy, and a success also for the method of the continual inhalation of antiseptics. Or he might decide that it was a failure for both methods. But I think he would not decide that it was a failure for vaccine therapy and a success for the method of the continuous inhalation of antiseptics. I think he would remind the letter-writer that "with what measure you mete it shall be measured to you again."

I have suggested all these difficulties to you. I confess I do not see my way out of them, unless perhaps we could content ourselves, in cases like those which have been cited above, to abstain from pronouncing a verdict on the summarised result of the whole. In such cases we might, it seems to me, content ourselves with giving a verdict on each successive movement in the game.

If I have succeeded in making you see eye to eye with me in this matter, if I have succeeded in making clear to you how in many cases almost insurmountable difficulties stand in the way of a final decision on the results obtained in the individual case, it will not be necessary for me to emphasise the fact that it must be hopeless to attempt to summarise our verdicts on vaccine therapy in any statistical form. I have, in conclusion, only one or two passing remarks to make in connexion with the question of the mode of administration of the vaccine.

III.

Mode of Administration of the Vaccine.

Probably to those who are familiar with Dr. Arthur Latham's work the issue as to whether the administration of vaccine by the mouth is an improvement over the method of hypodermic inoculation will be the first issue to present itself for consideration. For all of us, however, who approach it from the standpoint of the laboratory, this issue was already *res judicata* before it was brought into prominence by Dr. Latham. I had satisfied myself long ago—and the results of my experiments are embodied in my "Short Treatise on Antityphoid Inoculation"—that, though typhoid vaccine may be absorbed by way of the intestinal canal, it is only badly and incompletely absorbed, and above all that its action is uncertain. My friend and successor at the Royal Army Medical College, Sir W. B. Leishman, has carried out far more extensive and more careful experiments in connexion with the same question, and has arrived at the same result. He finds that inoculation by way of the alimentary canal is an extremely uncertain process. I do not think it is necessary to go any further than that, for science never sanctions a more complicated and more uncertain method being employed where a simple and certain one, such as subcutaneous inoculation, is available. And I would submit that the idea that a *via media* can be found between the antique system of prescriptions, with doses taken three times a day, before or after meals, and scientific applications of bacteriology, and the idea that that *via media* can be found in the administration of vaccines by the mouth, ought steadily to be put away from us. The new wine of bacterial vaccines cannot with impunity be poured into the old bottles of ancient medicine.

There is, in conclusion, just one other issue which I should like to put before you for consideration. The problem has been before my mind for a long time, and I understand that it has also suggested itself to others. Let me introduce it to you by recalling to your mind the mental picture which I dwelt upon at the outset of this discourse. You will remember that I suggested to you that the rationale of vaccine therapy was to be found in the exploitation of the unexercised immunising capacities of the uninfected tissues.

In other words, I suggested that the antibacterial substances which are elaborated in the organism in response to inoculation are elaborated by the tissues into which the vaccine is introduced. Now inasmuch as we may make our inoculation into any part of the subcutaneous tissue, it would, upon the theory that antibacterial substances are produced at the site of inoculation, seem to follow that we ought, by inoculating in a series of different places, to get a summation effect. The idea that such a thing might be opens up whole vistas of therapeutic possibilities. But at present the achievement of a summation effect from a series of simultaneous inoculations undertaken in different parts of the body belongs, like the achievement of a summation effect from a series of consecutive inoculations undertaken each after the previous one has evoked its immunising response, to the realm of unrealised possibilities. There lies before us here a wide and very difficult and unexplored field of work.

"Something lost behind the Ranges. Over yonder.
Go you there."

A CASE OF CHONDRO-CARCINOMA OF THE TESTIS.[1]

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THIS case is published because it seems to be rare and interesting from both clinical and pathological standpoints. The growth of the testis belongs to the class "embryoma," 23 cases of which are described, mainly from the pathological aspect, by Nicholson in the Guy's Hospital Reports.[2] Particular attention is called to the microscopic examination of the metastatic growth, possible in only one of Nicholson's cases—viz., his Case 60—the well-known case of Sir James Paget, re-examined by Kanthack and Strangeways. The value of the "creatinin and creatin excretion" in helping to determine the possibility or otherwise of successful operation should also be noted.

Clinical account of the case (W. S.).—The patient was a man, aged 30 years, with a strong tuberculous family history, three sisters and one brother dying from phthisis between the ages of 19 and 30. The patient was struck by a hockey stick on the left testis in February, 1908. He had pain, stopped playing for two minutes, then finished the game. Swelling of the testis appeared at once and gradually grew larger, and he wore a suspensory bandage; he had no pain and did not lose flesh. On Feb. 5th, 1909, he consulted Dr. Bloxham of Cardiff, who brought him to Mr. Sheen on Feb. 12th. He was well nourished and in good general health. The left scrotum contained a smooth, ovoidal mass, roughly as big as the adult fist, hard, uniform, elastic, not tender, not translucent, veins not dilated, testicular sensation retained at the upper and front part of the swelling, and no thickening of the cord. Rectal examination showed nothing abnormal. The patient was placed in a nursing home and on Feb. 16th the testicle and cord were removed through an inguinal incision, the inguinal canal being opened to its outer end. The cord was apparently normal. The patient left in 14 days with the wound soundly healed. Mr. Sheen next saw the patient on June 3rd. After leaving the nursing home he had gained from 11 to 12 pounds in weight, but latterly his weight had been stationary. He had noticed an abdominal swelling for a fortnight. There was a large abdominal tumour, hard, elastic, smooth, prominent, slightly tender, reaching from the umbilicus to the symphysis, and from the left anterior superior spine to three inches to the right of the middle line. Slight frequency of micturition was present. There was a slight yellow tinge on the cheeks. The patient was told of the gravity of the condition and another surgical opinion was suggested. He saw Mr. Stanley Boyd in London, and Mr. Boyd has kindly stated that he made a small abdominal incision and found a little bloody fluid, a greenish tumour, and omentum studded with nodules of growth. The patient, returning to his relatives, was afterwards under the care of Mr. R. E. W. Brewer of Newport, Mon. He was tapped twice for ascites. He died on August 20th. There was no necropsy.

Description of the tumour (H. A. S.).—Its macroscopic appearance shows an irregularly nodular oval-shaped tumour weighing 450 grammes. Dimensions 12 cm. by 8 cm. by 7 cm. The tunica vaginalis testis, which is intact, is thickened and its surface covered by many ramifying dilated veins. The membrane with the vessels can be easily separated from the underlying tumour. The globus major and minor are atrophied and small. Attached to the mass is a portion of the spermatic cord about 7 cm. in length, the structures of which appear natural. The testis is replaced by a uniformly hard growth of a greyish-white colour. Scattered throughout its substance are many minute glistening particles of cartilage, small cysts containing clear fluid, and small hæmorrhagic foci. There is no evidence of calcification, bone formation, or hair.

Microphotograph of the primary growth of the testis. *a*, Cystic space. *b*, Mass of young cartilage. *c*, Epithelial nest-cell. *d*, Spheroidal cells of carcinomatous type.

Sections were cut from the cortex and the deeper parts of the tumour, from the globus major and minor, and from the spermatic cord. A portion of the secondary growth in the abdomen was secured by Mr. Boyd, who has very kindly supplied a microscopic section which is described below.

The histological findings are briefly as follows:—A connective tissue stroma of varying characters. A large number (*a*) of hollow, cystic spaces and tubules lined by epithelial cells which differ in type, some columnar, others cubical or flattened; (*b*) masses of young cartilage which is richly cellular; (*c*) numbers of epithelial cell nests; and (*d*) masses of spheroidal cells of a carcinomatous type, which show some attempt at alveolation and which are supported by a loosely woven connective tissue stroma. The structure of the growth in the abdomen is similar to that of the primary growth. It is to be noted, however, that the connective-tissue stroma is much more delicate and cellular, and is in places of a myxomatous type. There are, further, no epithelial cell nests. The same branched tubular and cystic spaces with different types of epithelial lining and the same masses of carcinomatous cells mentioned above are easily recognised, as is also the formation of cartilage. The globus major and minor do not show any evidence of infiltration. Their tubules are degenerated and filled with débris, and there is a considerable increase in the fibrous connective tissue of the surrounding parts. The spermatic cord does not show any

[1] A paper read before the Cardiff Medical Society, Feb. 8th, 1910.
[2] G. W. Nicholson: New Growths of the Testicle, Guy's Hospital Reports, vol. lxi., 1907, p. 249.

evidence of cartilaginous infiltration; nor do its blood-vessels, lymphatics, or duct betray any sign of cancerous infection.

Following the descriptions of new growths of the testis as given by Nicholson,[3] the tumour may be classed as an embryoma in which the hypoblastic layer has undergone a malignant change giving a spheroidal-celled carcinoma.

Analysis of the urine (R.L.M.W.).—The recent work on the significance of the excretion of creatin in malignant disease, particularly of the liver, whether primary or secondary, led to inquiry into the matter in this case. For this purpose a 24 hours' sample was obtained on March 5th, 1909, three weeks after the operation. At this time a clinical examination of the patient showed no palpable metastatic deposits, and if the creatinin excretion was normal, such a result would have corroborated the opinion that there was no secondary growth of any size present in the abdomen or abdominal organs. The analysis of the urine gave the following results: Volume, 1200 cubic centimetres. Acidity 40·5 per cent. in terms of $\frac{N}{10}$ NaOH. Specific gravity, 1015. No sugar. No albumin. Preformed creatinin estimated by means of the method devised by Folin, 1·240 grammes. Creatin calculated as creatinin, 1·160 grammes for the total daily excretion.

The creatinin excretion in normal individuals varies between 1 and 2 grammes per diem, and is in general proportional to the body weight. The ratio of creatinin excreted per kilogramme of body weight, or in other words the "creatinin coefficient," varies between 18 and 30 milligrammes per kilogramme. The creatinin value in this case is low considering the body weight of the patient—viz., about 67 kilogrammes—the coefficient being 18·7 milligrammes. Now, creatin is entirely absent from normal urine, and since it is not excreted as a result of its ingestion it is clearly derived from some pathological changes taking place in the organism. Mellanby has clearly demonstrated[4] that creatinin is directly related to the creatin contained in muscle and other tissues, and that the latter is converted into creatinin in the liver. In hepatic disease he finds the creatinin excretion is lowered. There seems, however, to be a very marked difference between the excretion of creatinin and creatin in cirrhosis of the liver and carcinoma of the liver respectively. In cirrhosis of the liver the creatinin content of the urine is low and creatin is almost entirely absent. On the other hand, in carcinoma of the liver the creatin excretion is high, and in this case reaches a total of 1·160 grammes for the 24 hours.

These results have been confirmed by Hoogenhuyze and Verploegh,[5] but in addition they find an increased excretion of creatinin in some cases. The various details and also tables of results will be found in the respective papers of the above-mentioned authors. The results obtained by one of us (R.L.M.W.) in an investigation of several cases of malignant disease tend to support the view put forward by Mellanby. The outcome of this work seems to establish the value of the changes in creatinin and creatin excretion as a means of diagnosis in malignant disease. In the present case the creatinin excretion being subnormal and the creatin excretion high, it was concluded that the chondro-carcinomatous growth was not confined to the testis and neighbouring structures but had invaded other regions and was probably of widespread distribution. This conclusion was later shown to be correct, although, unfortunately, the want of a necropsy prevented an investigation of the condition of the abdominal organs.

Conclusions.—The following brief conclusions are drawn from the present case, from an interesting case recorded by Caddy[6] and from Nicholson's paper. All primary new growths of the testis are comparatively rare. Carcinomata are commoner than sarcomata. Carcinoma proper and embryoma occur with about equal frequency. Chondro-carcinoma belongs to the embryoma class. Its usual characters are as follows: a tumour of the testis in a male adult, of average age 30, often following an injury, particularly a blow, sometimes with a considerable latent period between the blow and the rapid growth of the tumour. The tumour is often painless and only noticeable because of its size and weight. The general health is at first unaffected and may remain so even at the commencement of the formation of metastases. Metastasis is rapid and general, abdominal organs, and next in frequency lungs, being affected. The growth is often highly malignant. Microscopically, the growth originates in the testis and contains representatives of all the embryonic layers; commonly it is the hypoblastic portion which assumes malignant properties. Involvement of the liver by secondary growth is shown (as with other malignant growths) by the diminution of creatinin and the appearance of creatin in the urine. With such alteration the removal of the primary growth can be only palliative.

We have much pleasure in recording our indebtedness to Mr. Barton White, of the Cardiff Mental Hospital, Whitchurch, for the excellent microphotograph reproduced above.

Cardiff.

[3] Loc. cit.

[4] F. Mellanby: Journal of Physiology, vol. xxxvi., 1908, p. 447.

[5] Hoogenhuyze and Verploegh: Hoppe Seyler, Zeitschrift für Physiologische Chemie, vol. lvii., 1908, p. 161.

[6] Arnold Caddy: Chondro-carcinoma of the Testicle, Annals of Surgery, 1899, vol. xxx., p. 210.

THE ENUCLEATION OF TONSILS WITH THE GUILLOTINE.

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THE importance and advantages of the total removal of diseased tonsils are partially, but, we believe, not sufficiently recognised. As this operation is performed by most members of the profession both in surgical and general practice its results are often disappointing, owing to the recurrence of symptoms, so that one or even two further operations have to be performed before complete relief is gained. It is surprising that an incomplete operation such as tonsillotomy should have persisted so long, which does not fulfil the surgical canon "that the whole diseased focus should be removed." In order to carry out complete removal some form of enucleation is generally necessary, and this has usually been performed by means of dissecting forceps or other blunt instruments. The guillotine as generally used removes little more than the projecting portion of the tonsil, and in that large class of case where there is no projection beyond the faucial pillars the guillotine is considered inadequate or no operation is performed at all. In some cases the tonsil is completely enucleated with the guillotine, but this is the exception rather than the rule. By a special method of using the guillotine we are able in nearly 50 per cent. of all cases, including tonsils of all shapes and sizes, to enucleate the tonsil complete in its capsule in one piece. In other cases it is possible to remove the tonsil in two or more pieces even to the last fragment of capsule. The recurrence of symptoms after tonsillotomy is somewhat discreditable to the method. Serious discomfort, inconvenience, and illness during an important period of life—namely, that of adolescence—are only too frequent in those who have had their tonsils removed previously, commonly more than once. In these cases the septic focus remains, and is able continuously to exert its harmful effect.

There are some anatomical points in connexion with the tonsil of importance from a surgical point of view. The tonsil represents a lymphatic gland, with numerous lacunæ which extend through its substance as far as the capsule. Its two surfaces, faucial and cervical, have important relations. The faucial, which is seen on looking into the throat, may project for some distance towards the middle line, and is studded with the orifices of the lacunæ; this is their narrowest part, so that there is no readiness of discharge should the lacunæ become filled with pus or caseous material. The cervical surface embedded in the wall of the pharynx is covered by a distinct capsule which is connected to the pharyngeal aponeurosis by loose areolar tissue, so that the tonsil can be freely moved over this surface. Its firm attachments are those where its mucous membrane joins that of the pillars of the fauces, and this is the only part which requires division in the operation of enucleation. The upper pole of the tonsil is usually

rounded and free, while the lower extremity tapers and is frequently connected with the lymphoid tissue at the base of the tongue. The main blood-vessels in the neck are situated at some distance from the tonsil and in enucleation the organ is pushed still further away. In size the tonsil varies considerably. Some of the specimens the photographs of which are reproduced measure 1¼ inches in their vertical direction; others the smallest, may be only between one-half and three-quarters of an inch long. These we have called the large and small size respectively in the following description; others occupying an intermediate position we call the moderate in size. The tonsils are frequently infected—the anatomical condition of the lacunæ makes these readily retain any infected material. Most pathogenic organisms have been found in the lacunæ, and we have taken swabs of the specimens for some time and have demonstrated most of the commoner organisms. Pus or caseous masses may be seen protruding from the orifices of the lacunæ in many cases. The tonsils may be enlarged, and in association with adenoids cause the characteristic symptoms. In a fair proportion of cases the tonsil is not enlarged, though considerably diseased, and undoubtedly the source of trouble, and the doctrine of septicity, not size, is a most important one. Fig. 1 shows that with a large

FIG. 1.

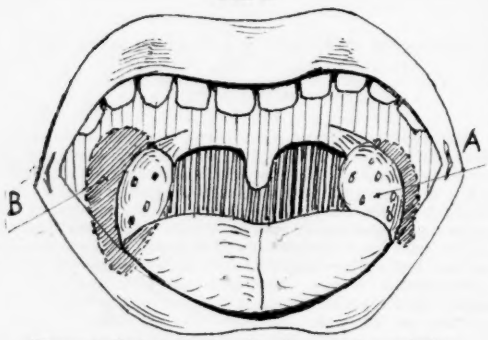


Diagram to illustrate situation of tonsil. A, surface projecting beyond anterior pillar. B, part embedded in pharyngeal wall (shaded area).

or medium-size tonsil where there is considerable projection towards the fauces and which appears large there is still in many cases a larger part embedded. In others where no projection exists or there is seen only a small slit between the faucial pillars there may be a considerable mass embedded in the pharyngeal wall and these are frequently the most septic cases. (Fig. 2.) In a large proportion these

FIG. 2.

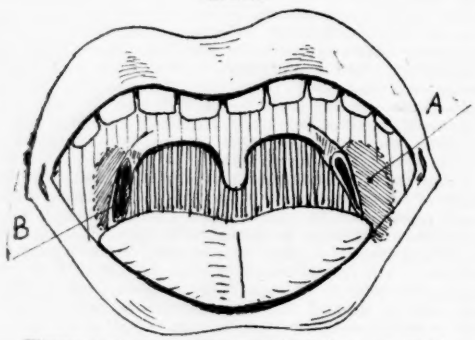
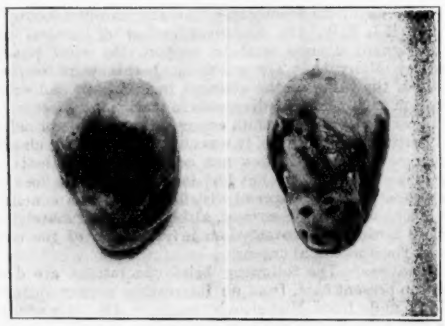


Diagram to show situation of small tonsils in a mere slit, B, between faucial pillars. The large mass of tonsil, shaded area A, is embedded. The tonsils do not appear enlarged, but are often grossly septic.

cases are passed over as not having enlarged tonsils. The necessity for total removal is abundantly proved by an examination of enucleated specimens. We have mounted a number in which under the capsule numerous yellow areas exist. These are caseous plugs filling the lacunæ and extending down to the capsule and which later may readily give rise to suppuration. This represents a natural injection of the lacunæ and demonstrates their extent better than those in which we have made artificial injections, and gives a ready explanation of peritonsillar abscess. After tonsillotomy the open mouths of the lacunæ are frequently seen occupied by yellow plugs, and in many cases it requires the faucial pillars to be separated before a small septic tonsil can be seen. These latter cases when acutely inflamed frequently bulge outwards, and we have found such a small tonsil containing half a drachm of pus, causing an extensive lymphadenitis of one side of the neck, and which appeared quite small from the faucial surface after removal of the whole pharynx at the post-mortem examination. After inflammation, the tonsil may become adherent to the pillars of the fauces, while infection passing through the bases of the lacunæ leads to adhesions between the capsule and the pharyngeal aponeurosis. The baneful effects of tonsillar infection are numerous and need only be mentioned; recurrent sore throats, due to attacks of tonsillitis, are quite common and persist so long as infective material remains. Infection through the bases of the lacunæ leads to a cellulitis of the tissue outside the capsule forming the peri-tonsillar abscess, which frequently recurs so long as the septic lacunæ remain. These with foul breath and bad tastes in the mouth are the commoner local disturbances. Tuberculosis of the cervical glands frequently owes its origin to infection through the tonsil; rheumatism, acute and chronic, to an infection by the streptococcus, while a small septic embedded tonsil may be the cause of a general ill-health and is often the undiscovered focus of some distant infection.

The advantages of enucleation by means of the guillotine are as follows. The method is simple and is only a modification of the common method of using the instrument. In hospital practice, where a large number of cases require treatment, and especially so as a result of the medical inspection of school children, some rapid method is indispensable. The total time required to do ten cases is about 40 minutes. In some cases 14 have been operated on in 40 minutes, and in others 13 cases in 55 minutes, the patient being anæsthetised in the theatre on the operating table. The method allows of the operation to be performed under nitrous oxide gas, or in our practice under ethyl chloride. The tonsils may be satisfactorily removed under local cocaine anæsthesia. Something over 600 cases were operated on last year (1909) without mishap. This one method is applicable to tonsils of all shapes and sizes. The actual time taken to remove the tonsils is less than one minute on

FIG. 3.



A B

Two large tonsils enucleated entire. A, Shows unbroken capsule of the cervical surface. B, Shows faucial surface with the orifices of the lacunæ. Natural size.

the average. The whole operation is under direct vision. The pressure exerted by the guillotine and by the finger can be regulated to a nicety, and the amount varies considerably with different tonsils and is better than pressure below the angle of the jaw. For purpose of description we use the following classification of results:—

1. *Complete enucleation in one piece.*—This represents the whole tonsil complete with an unbroken capsule In about 50 per cent. of cases the tonsil can be pushed into the ring of

the guillotine and can be enucleated entirely with a complete capsule. (Fig. 3.)

2. *Complete removal, but with not quite all capsule.*—In these cases, owing to the thickened capsule and adhesions, the whole tonsil is removed, but a small hole may exist in the capsule.

FIG. 4.

Two pairs of small tonsils enucleated entire, arranged to show faucial and cervical surfaces. Two-thirds natural size.

3. *Complete enucleation, but in two or more pieces.*—In those cases where, owing to large size or adhesions, the tonsil does not readily engage in the ring of the guillotine, a portion of the tonsil is removed. A second application of the guillotine removes the remainder of the tonsil with its capsule. (Fig. 5.)

FIG. 5.

A B C

Two large tonsils removed from the same patient. A, Cervical surface of tonsil with complete capsule. B, Cut surface of the first part showing the open lacunæ. C, Outer surface of the second part showing the remainder of the capsule. When these two parts are placed together the tonsil is complete. Natural size.

In some cases where a separate portion of tonsil exists in the hyoid fossa, this is separately removed by the guillotine; such a hyoid tonsil is seen in Fig. 6, while flat tonsils are

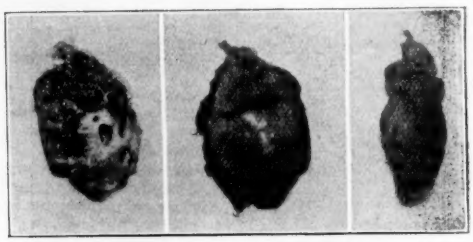
FIG. 6.

Hyoid tonsil, removed with the guillotine from the hyoid fossa. Natural size.

illustrated by Fig. 7, A, B, C. In some few cases removal has been incomplete, though even in these cases more tonsil is removed than by the usual method, and we are convinced that no other method of removal could give better results in the particular case, as in such cases the tonsil is so adherent to the surrounding tissues that not even the finger-nail or scoop will separate it.

Before operation the great essential is to make the mouth as clean as possible. In the waiting time before admission the patient visits the dentist, where the carious teeth are dealt with, and in children sufficiently old a gargle containing salicylic acid is prescribed. The patients are admitted the day before and remain in hospital two days after the operation. For operation the patient is placed in the dorsal position and a gag is inserted on the left side of the mouth. Ethyl chloride is administered, and when under its influence the patient is turned partly over on to the right side, the head lying on its right side on a level with or slightly above the trunk, so that the cheek pouch is on a lower level than the fauces and that blood may readily collect and run out of the mouth. The gag is then opened. The guillotine,

FIG. 7.



A B C

Flat tonsil enucleated. A, Faucial surface. B, Cervical surface with complete capsule. C, Lateral view. Natural size.

a Lennox Browne's modification of the McKenzie, with the shaft specially thickened, is first used as a tongue depressor and the lower tonsil seen. The operator stands facing the patient's head and on the right side. The guillotine being held in the right hand, the ring is passed under the lower border of the tonsil, which is pressed upwards towards the soft palate. The left index finger is then placed on the outer part of the anterior pillar of the fauces and presses the tonsil into the ring. At this time the blade is gradually pressed home with the thumb of the right hand. It enters between the tonsil and the anterior pillar, cutting the mucous membrane connecting the two. While cutting, the hand is gradually pronated, so that the under surface of the guillotine looks inwardly and finally upwards, the tonsils being separated from the pharyngeal wall during this manœuvre; the final cut severs the mucous membrane connecting it to the posterior pillar. The tonsil is then lifted out on the under surface of the guillotine, which is now uppermost. The right tonsil, that lowest down, is removed first. To remove the upper tonsil the patient is rolled back so that the head lies in the dorsal position. The patient is readily turned by a nurse who stands opposite the surgeon. The operator now passes to the side of the patient, the guillotine is again inserted, and the ring passed below and behind the tonsil which is pressed upwards towards the soft palate, the left index finger being again used to force the tonsil into the ring. The connexions are cut through as above described, the hand being meanwhile pronated and the tonsil removed on the under surface of the guillotine, which has become uppermost. Any hyoid projection can now be felt and if present removed. In less than half the cases the tonsil can be felt to slip into the ring, and in these instances it frequently comes out entire. In others it will not wholly engage, and one can say definitely that two or more attempts will be necessary to remove the whole tonsil. The above method requires some practice before it is possible to readily enucleate the tonsil. The hæmorrhage is sharp for the moment but soon stops, and we have had as yet no alarming hæmorrhage. We consider that no more blood is lost than after the other varieties of removal. Each tonsil is examined immediately after removal. If incomplete, the remainder, which can be readily felt by the finger inserted between the faucial pillars, is then removed. In the so-called recurrent cases and in those after numerous attacks of tonsillitis the organ does not so often come out whole. It usually comes as a surprise to many, however, to see the large amount of tonsillar tissue removed even after one or two previous tonsillotomies. A similar surprise occurs when a tonsil of large size is enucleated where from a mere inspection of the throat no tonsil was visible. By the pressure of the finger and the use of the guillotine by the above method, the last particle

of tonsillar tissue can be removed. The operation gives the most satisfactory results; we have examined a number of cases at varying periods after the operation and after removal of the tonsil in one or more pieces. The raw surface left rapidly granulates up and is assisted in closing by the approximation of the anterior and posterior pillars. There has been no selection of cases.

FIG. 8.

Two tonsils removed three weeks after previous operation of tonsillotomy. Total removal by the guillotine.

FIG. 9.

Pair of medium-size tonsils, enucleated entire. Lateral view to show projection of tonsillar tissue from the capsule. Natural size.

We append an analysis of 150 cases which were operated on during the past three months.

150 Cases; 298 Tonsils Present in Collection.

Large.—1. Enucleated complete in capsule, 45, or 36 per cent. 2. Not quite complete capsule, 25, or 20 per cent. 3. Enucleated in two pieces, 42, or 33 per cent. 4. Removed in three pieces, 6. 5. Removed in four pieces, 1. 6. Removed in five pieces, 1. Total, 120.

Medium.—1. Enucleated complete in capsule, 55, or 44 per cent. 2. Not quite complete capsule, 36, or 23 per cent. 3. Enucleated in two pieces, 29, or 23 per cent. 4. Removed in three pieces, 1. Total, 121.

Small.—1. Enucleated complete in capsule, 27, or 50 per cent. 2. Not quite complete capsule, 20, or 27 per cent. 3. Enucleated in two pieces, 8, or 14 per cent. Total, 55.

Complete enucleation.—Large, 45; medium, 55; and small, 27. Total, 127, or 42·3 per cent.

Complete removal but not quite all capsule.—Large, 42; medium, 36; and small, 20. Total 81, or 27 per cent.

Enucleation in two pieces.—Large, 42; medium, 29; and small, 8. Total 79, or 26·3 per cent.

Incomplete.—Three cases.

The above analysis of the cases operated on shows that in 42 per cent. the tonsils with their capsule were enucleated entirely. In the remaining cases the entire tonsils with capsule were removed in one or more pieces. In three cases only was the removal incomplete. We have exhibited specimens on several occasions at the meetings of the Newcastle-on-Tyne Clinical Society, Northumberland and Durham Medical Society, and the North of England Branch of the British Medical Association.

VERMINOUS APPENDICITIS.

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AMONGST the objects found in the appendix are things from the mineral, vegetable, and animal kingdoms; we have pins and shot, seeds and worms. The appendix may catch, keep, and play with anything small enough to enter the only door it possesses, but it frequently adds to the size of the object caught by a coating of fæcal matter and lime salts. Worms probably find, now and then, a secluded spot for breeding in an undisturbed manner in the appendix.

The case of threadworms in the appendix now recorded is by no means exceptional when the literature of what has been found in the appendix is looked up. I have only twice met with worms in the appendix in hospital or private practice, but it is very possible that in some instances sufficient care was not taken to minutely examine all the contents of an excised appendix.

The case in point occurred in a girl, aged 7 years, who was sent into the Cumberland Infirmary on Feb. 4th, 1910, by Dr. Charles W. Graham of Carlisle for operation on account of abdominal pain and distension, fever, vomiting, and tenderness in the appendix region. The appendix region was more tender, and persistently tender, than any other part of the abdomen, but the pain was diffused over the abdomen and the distension was suggestive of general peritoneal infection.

A few hours after admission the child was submitted to operation. The cæcum was found to be inflamed, but no lymph was present. The appendix, when brought to the surface, was swollen and redder than normal. I removed it, thinking to find a mucocele. The abdomen was closed. It was not until the appendix was slit up that a nest of actively moving threadworms was seen, some of which escaped. They were the oxyuris vermicularis. The child's cæcum was soft and velvety, and I felt sure after finding the parasites that there were worms in the cæcum also.

After the operation the usual remedies were given, and a careful search was maintained for a week or more, but no sign of a worm was visible in the motions, which were washed, strained, and examined with a lens. Films of blood taken showed a marked polymorphonuclear leucocytosis, but the eosinophile cells were not increased in number, being rather fewer than usual. The child left the hospital recovered on March 12th.

I have merely glanced at the clinical side of the case because there is no sign at present known peculiar to verminous appendicitis, and, even if there was, operation would be called for in much the same way as in any other appendicitis.

The part played by worms in the production of appendicitis is discussed by Howard A. Kelly,[1] who alludes to the perforation of the appendix by worms and their escape into the abdominal cavity, and it would seem probable that the threadworm is less likely to perforate than the lumbricus. Again, threadworms are more likely to be met with in the case of children as a cause of appendicitis, and if they formed a sort of colony or nest in the terminal portion of the appendix, as they did in the present example, it is not easy to see how they would escape, unless by causing ulceration of the mucous and other coats of the appendix.

That worms—i.e., the oxyuris—can cause considerable pain to a child, local tenderness, and even peritonitis, seems to be agreed upon by all who have written on the subject or who have recorded cases. Lockwood,[2] for example, gives a case where the appendix contained pus, fæcal matter, and threadworms.

Since operating upon the girl in hospital I have met with threadworms within concretions in the appendix of a male patient aged 30 years. In his case there were discomfort on pressure over the appendix and symptoms of colitis. On

[1] Appendicitis and other Diseases of the Vermiform Appendix, second edition, 1909.

[2] Appendicitis, second edition, 1906.

removal of the appendix hard concretions were felt and seen in the tube; the tube was slit up, showing the terminal portion of the mucosa swollen and congested, but not ulcerated. This was the bed occupied by the larger concretion. The concretion was of a bright yellow colour, was composed of semi-soft fæcal matter, and was of the size of a small lemon pip. When the concretion was cut into a thread-like object was seen at once and declared by Dr. A. I. Shepheard-Walwyn of Wetheral, near Carlisle, to be an oxyuris. Examination with a lens confirmed this.

The appendix removed was sent to a laboratory for report, and in a concretion sent with the slit-up tube two more worms (oxyuris vermicularis) were found, both being immature females. No ova were found in the concretion nor on the mucous surface of the appendix.

I mention this case especially because the discovery of threadworms within concretions in the appendix has been verified, first by Dr. Shepheard-Walwyn, and in the second place, in another concretion from the same case, by Mr. Richard Muir, assistant pathologist to the pathological department in the University of Edinburgh. It looks rather as if threadworms may have formed the centre upon which fæcal matter collected, a mode of action quite different from the first case, where the worms formed a nest without any fæcal matter whatever.

Worms in the appendix have been dealt with at length by Aimé Guinard,[3] and under "Parasites Filiformes" the oxyuris and trichocephalus are stated to have been met with frequently in the appendix in a greater number of cases than is noted in this country. Out of 200 cases of removal of the appendix Guinard found the trichocephalus in 15 and the oxyuris in 3 cases. There can be but little doubt that the oxyuris is occasionally overlooked, especially when it occurs mixed up with fæcal concretions, for it was only when the concretions were cut into that the worms were found in my second case. Guinard sums up by saying, "I am absolutely convinced that the parasites can play an important rôle in the pathology of appendicitis." With regard to the habitat of the oxyuris, Guinard states that it is in the ileum, and that the females fecundate and pass into the cæcum and appendix until the maturity of their eggs, and they then fix themselves into the rectum, where they excite "les démangeaisons anales bien connues."

It is not simply in children that the oxyuris is met with apart from appendicitis, but in the cases recorded now it will be seen that one occurred in a girl, aged 7 years, and the other in an adult of 30 years of age.

That a worm could enter the appendix is noted by Dr. James Milman Coley,[4] who stated of the ascaris lumbricoides or common round worm that "their migrations sometimes extend to the biliary or pancreatic ducts or the vermiform appendage of the cæcum." No mention is made of the entry of threadworms.

In Kelly's "Appendicitis and Other Diseases of the Vermiform Appendix,"[5] the author states that it has been long known that enterozoa are not uncommon occupants of the appendix, and in numerous cases they have escaped through a perforation into the abdominal cavity. Perforation is denied by Dupallier,[6] but they can act as foreign bodies and determine an ulcerative appendicitis. Kelly remarks that the oxyuris is sometimes found in the normal appendix in large numbers, and may cause attacks of severe spasmodic pain. Aschoff[7] of Freiburg has come into touch in the course of examinations with cases of trichocephalus (2) and oxyuris (2).

It will be seen that the occurrence of parasites in the appendix is probably world-wide, and may in reality be more frequent than it is considered to be if the concretions removed from the appendix were always examined with minute care. In the appendices examined by Aschoff were found the common objects so frequently met with in this country—viz., bristle, hard seeds, sand, and lead, as well as the worms already spoken of.

About eight years ago the occurrence of threadworms in the appendix was the subject of several contributions to THE LANCET, and surgeons who had met with cases recorded their experiences. Mr. J. Lionel Stretton[8] of Kidderminster met with two threadworms, both females. Dr. G. F. Still[9] of London, in a letter drew attention to a case of a boy, aged 9 years, having 111 threadworms in a swollen and thickened appendix, and he seems to favour the view that threadworms may set up appendicitis. Professor Begouin,[10] in the *Gazette Hebdomadaire des Sciences Médicales de Bordeaux*, contributed a paper on threadworms and appendicitis, and related a case of a woman, aged 24 years, whose appendix contained 15 threadworms, with ulceration of the mucous membrane. Mr. J. Hutchinson, jun.,[11] found an appendix full of lively threadworms, but the occurrence was exceptional in his practice at the date his letter appeared. Von Motz,[12] in the *Écho Médical du Nord*, 1902, p. 217, stated that he had met with the oxyuris in the appendix, and considered that chronic appendicitis might be induced by the trichocephalus or the oxyuris.

With regard to the pathology of these cases, I do not think any doubt rested in the minds of those who were present at the operation in my first case (that of the girl aged 7 years) that the acute abdominal symptoms (temperature 103° F., vomiting, pain, distension) and the reddened and inflamed appendix were conditions due to the presence of the worms, but whether one or two worms would produce the same effect may be open to doubt.

In my second case there were no loose worms, because they were enclosed in concretions of somewhat soft fæcal matter, and the inflamed portions of the mucous coat of the appendix were due in all probability to the irritation of the concretions and not to the worms.

Carlisle.

[3] Nouveau Traité de Chirurgie Clinique et Opératoire, A. Le Dentu, Pierre Delbet, xxiv., Affections Chirurgicales de l'Abdomen, 1910.
[4] Practical Treatise on the Diseases of Children, 1846, p. 229.
[5] Second edition, 1909.
[6] Thèse de Paris.
[7] Die Wurmfortsatz Entzündung, 1908, pp. 6-7.
[8] THE LANCET, Sept. 27th, 1902, p. 895.
[9] THE LANCET, July 12th, 1902, p. 125.
[10] THE LANCET, Sept. 8th, 1902, pp. 687-688.
[11] THE LANCET, Sept. 30th, 1902, p. 837.
[12] THE LANCET, Nov. 1st, 1902, p. 1211.

A NOTE ON THE TOXICOLOGY OF CARBON MONOXIDE.

BY W. JAMES WILSON, M.D. R.U.I., D.P.H.,
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As a consequence of the increase in the use for heating and illuminating purposes of mixtures of coal-gas and carburetted water-gas, the profession and public have become familiar with the toxic and often lethal effects of carbon monoxide. However, the two cases which I describe below seemed worthy of reporting on account of the circumstances which led to the formation and escape of the poisonous gas into the air of the rooms. In one the carbon monoxide was a product of imperfect combustion in a gas-stove which was unprovided with a flue, whilst in the other its escape was due to the fusion of a lead gas-pipe by a leaky electric wire.

CASE 1.—On Dec. 22nd, 1909, at 7.30 A.M., the bodies of a man and woman, aged 35 and 30 years respectively, were found in a small office in Belfast. The room, which measured 15 feet in length, 10 feet in width, and 10 feet in height, was unprovided with a fireplace, and had a tightly-fitting door and windows, which were found closed. The man was dead when admitted to the hospital, and the woman died a week later. A post-mortem examination of the body of the man revealed the usual appearances presented by carbon monoxide poisoning, and the blood was found to be saturated to the extent of 60 per cent. with this gas.

At the inquest the jury found in both cases that death was due to carbon monoxide poisoning, resulting from imperfect combustion of the gas in a gas-stove, and recommended that the gas authorities should not supply gas-stoves unless a proper flue for carrying away the fumes was also installed. The imperfect combustion resulted from the fact that owing to the clogging of the burners the stove had "struck back." The evidence showed that the deceased had probably been 10 hours in the office. It may seem remarkable that the victims did not discover that the stove was at fault, but I find it is no uncommon thing to see a gas-stove or grate in use in this condition, the owner being unaware that it is not burning properly.

The results of a few experiments I made with regard to the production of carbon monoxide in gas-stoves are as follows. An examination of a gas fire (i.e., a fireplace

containing pieces of asbestos heated to redness by a row of Bunsen burners) showed that the amount of carbon monoxide given off into the air over the fireplace was inappreciable when the burners were properly lighted. When the burners "struck back" traces of carbon monoxide were given off. In one experiment 0·013 per cent. of carbon monoxide was found to be present in the air over the fire. When an ordinary Bunsen burner "strikes back" I find that the air escaping from the top of the burner may contain as much as 0·2 per cent. of carbon monoxide, and Haldane has shown that an atmosphere containing this amount of the gas is incapable of supporting life. The gas-stove associated with the unfortunate occurrence contained nine burners, the flames of which impinged on three perforated iron plates, and it is possible that these plates when red-hot contributed to the production of carbon monoxide. There was an asbestos tile behind the burners, but there were no asbestos "bricks" in the stove. I have an impression that when the products of combustion have to pass through incandescent pieces of asbestos more complete oxidation of them occurs. It is interesting to note that the man was found dead near the door, as if he had made an effort to escape and that this effort had accelerated his death, whilst the woman, although lying close to the stove, was still alive. Exercise is known to accentuate the poisonous symptoms even when non-lethal doses of carbon monoxide are inhaled.

CASE 2.—This was the case of a man, about 50 years of age, who was found dead in a bedroom on Jan. 7th, 1910.[1] Death was due to gas poisoning and the blood was saturated with carbon monoxide to the extent of 76 per cent. It appeared from the evidence that the deceased man was in the habit of going to his bedroom for a nap in the afternoon, and that on the occasion in question he had been poisoned by the escape of gas from a ⅜-inch gas-pipe which had fused owing to being in contact with a leaky electric wire. A ½-inch gas-pipe and an electric wire had been properly laid parallel to each other and about a foot apart underneath the floor of the bedroom. From the side of the ½-inch gas-pipe a ⅜-inch pipe came off at right angles, and in its path crossed the electric wire. At the point of contact fusion of the gas-pipe had occurred. A leakage of electricity had evidently generated sufficient heat to melt the gas-pipe and ignite the gas, which had burned long enough to scorch the surrounding boards, but as the space was very confined there was insufficient air to support combustion, so that the gas flame had become extinguished, and then the gas escaped into the apartment above.

The deceased had not been exposed for longer than two and a half hours to the effects of the gas. There was a fireplace in the room and the window was partly open at the time. Knowing the area of the room and the rate of escape of the gas, &c., I made a calculation to determine whether a poisonous atmosphere would have resulted if ordinary coal-gas had been in the pipe, and came to the conclusion that in that case death would probably not have occurred.

Haldane has shown that with coal-gas it is almost impossible to produce a poisonous atmosphere in a room by simply leaving the gas turned on during the night, whereas with water-gas a poisonous atmosphere is easily produced even in very large rooms. In conjunction with Mr. Harold Totton, B.Sc., I made an analysis of the Belfast gas-supply at this time and found that it contained on an average 20 per cent. of carbon monoxide. Ordinary coal-gas contains from 6 to 8 per cent. of carbon monoxide and carburetted water-gas from 30 to 32 per cent., so that the Belfast supply contained a mixture of about equal parts of these gases.

Haldane has also shown that deaths from carbon monoxide are enormously more frequent in cities using coal-gas mixed with carburetted water-gas than in cities in which coal-gas only is consumed. From statistical data he concluded that the number of accidents referable to the use of mixed gas would appear to increase approximately as the cube of the gain in percentage of carbonic oxide. Thus, if the percentage of carbonic oxide were increased from 6 to 12 the chance of being poisoned was not twice or even four times, but eight times as great as before the increase, and if the carbon monoxide became three times as abundant as heretofore the chances of being poisoned became increased no less than 27-fold. Carburetted water-gas began to be introduced into the Belfast supply in 1892. A return obtained from the coroner's office at Belfast showed the number of deaths from gas poisoning during the years 1889 to 1891 and 1907 to 1909 was as follows: 1889 *nil*, 1890 *nil*, 1891 one, 1907 two, 1908 five, and 1909 seven. Of course, there has been a great increase in population and in the use of gas since 1889, still a very large proportion of the deaths must undoubtedly be attributed to the increased amount of carbon monoxide in the gas-supply. Only one of the above deaths was due to suicide; all the others were occasioned by misadventure or accident.

McWeeney has shown that from the year 1880 to 1900 no death in Dublin was tabulated by the Registrar-General as having resulted from coal-gas poisoning, that the supply of carburetted water-gas mixed with coal-gas commenced at the beginning of 1900, and that during the four succeeding years there had been in Dublin 10 cases of gas poisoning resulting in 7 deaths. None of these deaths were suicides.

In America, where carburetted water-gas has been in use since 1880, the number of deaths from gas poisoning is enormous. The records of New York are instructive. From 1867 to 1880 there were 16 cases of gas poisoning; from 1880 to 1892 the number was 202. During recent years the number has increased still further, many of them being cases of suicide; for instance, in 1906 there were 419 deaths in New York due to gas poisoning, and of these 250 were the result of accident and 169 of suicide.

The facts which I have mentioned show how urgently such measures as the following are needed to prevent this wastage of life: 1. A limit should be put by Act of Parliament on the amount of carbon monoxide allowable in a gas-supply. The Departmental Committee recommended that the amount of carbon monoxide in the night supply should not exceed 12 per cent. 2. The inspection of gas-fittings and the prohibition of the use of gas-stoves unless provided with a flue. 3. Where the gas-supply of a town contains a large proportion of carburetted water-gas the householder should cut off completely the supply of gas to his bedrooms. The resulting inconvenience would be trifling compared with the risk which is otherwise incurred.

Bibliography.—J. S. Haldane: Appendix to the Report of the Departmental Committee appointed to Inquire into the Manufacture and Use of Water-gas, &c., 1899; also Journal of Physiology, vols. xviii., xx., xxii. E. J. McWeeney: Scientific Proceedings of the Royal Dublin Society, 1904.

Belfast.

[1] THE LANCET, Jan. 15th (p. 209) and 22nd, 1910 (p. 272).

THE VENTILATION OF SHIPS, PARTICULARLY MERCHANT SHIPS.[1]

BY FLEET-SURGEON W. E. HOME, R.N.

WHEN men begin to live together in society, I suppose their first reasoned step in hygiene concerns itself with the disposal of their excreta. Their earliest sanitary concern is to get safely rid of their solid and liquid dejecta. With these we have at sea no difficulty, but the gaseous excreta it is that are always giving us trouble in their removal.

Your houses ashore are severely limited in size, for reasons of economy, but ours even more. In the cost of ours must be reckoned, not only the capital expenditure, but the continuing expense of carrying them about on voyages. Each member of the crew adds for his accommodation two tons to the bulk of the ship; it will soon be three, and there are people asking for more. Thus it will be seen how difficult it is for owners to give more room to the men, and for us to get them satisfactory, that is, draughtless, ventilation into the very small spaces in which they live. While you, under protest, accept 300 cubic feet as the limit in a common lodging house, and require 600 in barracks, we at sea are jubilant because the Merchant Shipping Act of 1906 has enlarged the minimum cubic space for a merchant seaman, in ships laid down after 1906, to 120 cubic feet or 3 tons (albeit with deductions), a great advance on the 72 cubic feet formerly prescribed. Liverpool is trying to get 400 cubic feet per adult in houses let in lodgings. The emigrant who leaves Liverpool need only have 15 square feet of area on a deck 7 feet high, or 105 cubic feet, or perhaps, I think, 170 cubic feet on a lower deck less well lighted and

[1] A paper read at the Congress of the Royal Sanitary Institute at Brighton on July 9th, 1910.

ventilated than usual. In men-of-war bluejackets seem to get 200 cubic feet pretty generally.[2]

The more nearly we can approach natural conditions the better, but natural conditions are far beyond us and impossible.

In England the general motion of the atmosphere is eight miles an hour (Whitelegge), so that through a cross-section the size of a man (Galton) 6 feet by 1½ feet, these will flow some 400,000 cubic feet of air every hour. The advantage to health of this open-air ventilation was noted by Parkes to be strikingly shown in the improvement wrought on the health of cavalry horses, whose food, water, exercise, and treatment in other respects were tolerably uniform. Previous to 1836 the annual mortality of French cavalry horses was 18 per cent. They then got larger stables and an increased ration of air. By 1846 the death-rate was 6·8 and in 1862–66 it was 2·75, while in the Italian war of 1859 he tells us that 10,000 horses stabled in open sheds had hardly any sickness even. Each horse sick is a loss to his owner; each horse dead has a capital value, more readily brought to account than in the case of a man, consequently the need for ventilation here was strongly felt. I was told by a merchant captain, holding a prominent position, that he had as a younger man been very successful in command of horse ships, that the captain got a bonus on each horse landed, and that horse ships were the best ventilated of all—not improbable when the benefit of sanitation blessed both ship-master and ship-owner. It is difficult to convince people of improvements that do not write themselves down so in their bank books.

When we are in the open air we much enjoy our 400,000 cubic feet per hour, but we cannot live in this great flow, in fact, we build houses to keep it off us, so we must now inquire how much air we ought to have. A man's hourly output of carbonic acid is variously stated from 0·6 cubic foot (Whitelegge) to 0·8 cubic foot (Prausnitz, whose Austrian text-book is widely read in Germany). Professor J. S. Haldane states it at 0·6 cubic foot for a man at rest, 0·9 cubic foot generally, and 1·1 cubic feet during work; so I suppose we shall not be very far wrong if we take it at 0·8 cubic foot.

This quantity we must dilute with fresh air, but with how much fresh air? In England and America de Chaumont's old standard is still accepted. He found that if the carbonic acid in the air of barracks increased above 0·06 per cent., the air was "stuffy," had an unpleasant smell. Accordingly, he, and we follow him, considered 0·06 per cent. carbonic acid as the limit of respiratory impurity. The outer air already contains 0·04 per cent., so it can only take up 0·02 per cent. more—that is, 1000 cubic feet will take up 0·2 and 4000 cubic feet will be required to keep sufficiently diluted the 0·8 cubic foot of carbonic acid produced hourly by the average man. This same amount, 4000 cubic feet per hour, was also reached by Galton when calculating how much air a man required every hour to prevent the air about him becoming too damp, and by Dr. Shaw when deciding how much is required to keep down the temperature due to many people sitting and breathing together. So it has much sanction this 4000 feet of hourly ventilation supply to one man.

In Germany another standard is taken, 0·1 per cent. carbonic acid, Pettenkofer's original figure, the proportion submitted by Haldane and Osborn as sufficient for factories and workshops. If this be accepted, we see that each 1000 cubic feet of air can take up (0·1—0·04=) 0·06 per cent. of carbonic acid. That is to say, we shall now only want 1330 cubic feet of hourly supply. And from my experience I would say we shall do very well on a ship if we manage to get as much.

I have only spoken of carbonic acid percentages, for we measure the respiratory contamination by the easily estimated carbonic acid. The pure gas added, in the proportions of 0·06 (making 0·1 per cent.) to air, does no harm; at 2·5 per cent. it puts out a candle, but it must reach a proportion of 3 per cent. before, of itself, it causes unpleasantness, respiratory inconvenience to man. If the carbonic acid, however, be respiratory carbonic acid inconvenience and discomfort arise with far smaller percentages, particularly if they arise from the respiration of other persons. And it is not quite clear to what accompanying product the inconveniences are specially due. In any case it seems to increase uniformly with the carbonic acid. Flügge and his school urge that the chief physical inconvenience of overcrowding is interference with the agencies which naturally cool the body—the dryness, coolness, and movement of the air; that the air of overcrowded rooms is unduly stagnated, warmed, and humidified, so it has less cooling effect; that consequently there is a congestion or accumulation of heat in the organism, and that this it is causes the headache, giddiness, &c., of crowded rooms. Others believe these inconveniences due to the smells which people give off from the respiratory system, alimentary canal, skin, and clothing; in this case, the cleaner the people the less the need for so large an hourly supply, and Pettenkofer long ago pointed out how wasteful and unfair it was to expect ventilation to do the work of conservancy and ordinary cleanliness.

As bearing on these alternative theories, I must mention an interesting case of ventilation with unusually pure air, reported by Dr. W. H. B. Stoddart,[3] of Bethlem Hospital. We were all thinking a good deal about liquid air in 1902, and Dr. T. B. Hyslop suggested to Dr. Stoddart to use it instead of ether in his microtome. It gave great satisfaction and was the more valued as the laboratory was now found to be unusually well ventilated. Dr. Stoddart reports: "It is no exaggeration to say that after a morning's work in the laboratory I have felt as if I had been for a blow in the country." Unfortunately, a great rise in the price of liquid air has prevented further researches, amongst others some I had planned. Now what was it made the difference? Apparently only 66 gallons, 10 cubic feet of air, were used in a morning. No one can surely urge that it was the cooling effect of this 0·8 grain of air. I submit it is more likely that we shall find the explanation in what Dr. Stoddart says about the purification of the air as it is liquefied. At one stage impurities, being condensed, settle out, impurities "with a stench like a London fog," as he says. I submit it was the freedom of some of his laboratory air (but how little) from the "smells" or "the organic matter" the books mention in the air that accounts for the difference.

And now to go back to ventilation with ordinary air. We have agreed that in ships 1300 feet per head per hour are as much as there is any use asking for. How are we to get that? The first rule of ventilation must be emphasised: "Do good by stealth." As the Greek sage said, λαθε βιωσας, escape notice throughout your life, otherwise you will find yourself considered a nuisance. A ventilation current that attracts attention to itself ruins its own usefulness by its too-great zeal, gets itself disliked, and is probably at once put out of existence. The exceptions occur in the tropics, where a current slightly cooler and with some drying power is greedily welcomed. There is obviously at every temperature a velocity and a cooler temperature of ventilating current that would be just tolerable, slower as the temperature was lower, and conversely. I suppose the limiting condition to be the amount of loss of heat they produce in the time. Dr. Nocht of Hamburg, in his very valuable book for doctors of ships, "Vorlesungen für Schiffsärzte," says that no velocity above six feet a second is endurable; it must be low. People often say that sailors do not like air, that it is no use giving them ventilators as they will only close them up. To talk like this argues a narrowness of view. It is not air men object to, but cold air, especially damp cold air with its higher specific heat, and consequently greater chilling effect; cold air they will certainly exclude if they can. To meet this difficulty, in the first place give them more inlets, break the current up into smaller sections of less velocity, and if you really want to do them well warm the incoming air. The misery of cold is infinitely more painful, more acute than that of gradual suffocation, which is rather a soporific.

The most ready means of ventilation at sea is perflation, popularly known as a blow through. Here we take advantage of the existing wind or of the draught produced by the onward course of the ship. The air is collected by cowls, which direct it through shafts. Also, it may be sent below through temporarily fitted canvas shoots called wind-sails, or in calm weather by wind-scoops, in the ports. This is a very satisfactory method when available, as it supplies most cheaply enormous volumes of air to flush out and dry up the

[2] Gatewood's Naval Hygiene for the United States Navy, Nocht for the German Navy.

[3] THE LANCET, May 17th, 1902, p. 1385.

decks below. Often it is unavailable, because there is no wind, often because with the air rain- or sea-water would be carried down.

The official ventilation of emigrant ships is by perflation. Each statute adult is allowed 2½ square inches of inlet and 2½ square inches of outlet ventilator. His 1300 cubic feet must pass through these with a velocity of 20·8 feet per second, cruelly too fast. The German emigrant regulations only requires 1 square inch in each per person. Nocht points out that in calm weather, with the ship going at the low speed of 10 knots only, that means a current of 16½ feet per second, too fast for comfort and only giving 400 cubic feet per hour. There is more wind against the west-bound ships, so they have better air-supply when they are carrying most passengers, i.e., across the Atlantic.

The wind then fails us, and we have to bring our air in for ourselves, and the methods we employ are classed as natural or artificial, as Dr. Shaw has well observed, in proportion as they cost nothing specially or as they require money or energy definitely expended upon them.

Air becomes lighter when heated, also when it takes up water. Hence it is that on a damp day we say we feel the air heavy, not because the air is heavier but because, being lighter, it buoys us up less and it takes us a trifle more exertion to stand up and support our own weight. We it is are heavier.

The weight of a cubic foot of dry and saturated air at 30 inches barometric pressure, and at various temperatures, is given in the following table from Galton :—

Weight of 1 cubic foot of Air. Bar. 30 inches.

Temp. Fahr.	Dry air.	Air saturated with moisture
32°	566·85 grs.	565·58 grs.
40°	557·77 ,,	556·03 ,,
50°	546·82 ,,	544·36 ,,
60°	536·28 ,,	532·84 ,,
80°	516·39 ,,	509·97 ,,

Persons living in a room heat its air by convection off their persons, and, by respiration, reduce its density further by heating it more and adding moisture, and increase its density by replacing its oxygen by carbonic acid.

A.—A cubic foot of air (bar. 30 inches), temperature 60° F. (wet bulb 55°=humidity 71 per cent.), before inspiration, weighs 533 grs.

B.—A cubic foot of air (bar. 30 inches), temperature 98° F. (wet bulb 88°=humidity 61 per cent.), before inspiration, weighs 492·8 grs.

C.—A cubic foot of air (bar. 30 inches), temperature 98° F. (wet bulb 98°=humidity 100 per cent.), expired, weighs 496·15 grs.

So if a man breathed in an atmosphere like the sample *A* his expired air, *C*, would rise away from him, being now 7 per cent. lighter, but if he breathed in an atmosphere like the sample *B* the expired air would tend to fall, as being now 0·8 per cent. heavier. Dr. Shaw has given careful attention to this question, and finds that the temperature at which the reversal takes place is in the neighbourhood of 81° F. In a paper read to the Epidemiological Section of the Royal Society of Medicine on "A Disease of Overcrowding in Ships,"[4] I tried to explain by this principle, stagnation about 81° F., the enormous prevalence of respiratory disease which occurred in a ship at that temperature.

Persons, like the other surfaces in a room, radiators, walls, windows, &c., alter the temperature of air in contact with them, setting up convection currents. These convection currents are most important, and Dr. Shaw has done great service by showing how often ventilation schemes have miscarried through neglect of this great law—every person or surface warmer than the air of the room causes an upward current, every surface colder than the air in contact with it causes a downward current.

In ships the run of the ventilation currents is very complicated, and so little understood that an acute friend of mine, a lawyer in very successful practice at the Bar, told me that as a result of a large experience in cases where compensation was claimed for damages to cargoes through insufficient ventilation, he had come to the conclusion that air travelled in a ship always in the direction contrary to that you would expect. The same idea appears in Romeril's book, "Sanitation in the Mercantile Marine," where he says it is well known among seamen that the smell of bilge water and offensive cargoes works to windward, and Dr. Nocht also mentions the old advice to ventilate a sailing ship by turning the cowls on the weather side to act as exhausts. He also recalls an experience of his own showing that the air-currents in the saloon of a steamship, most unreasonably, travelled from aft forward, though there was a good breeze from ahead. These all only mean that the factors influencing ventilation have been incompletely observed and appreciated. The results are surprising, but we do not believe that the natural laws act erratically, only that we do not take enough pains to trace out and allow for all the factors in the problem.

I was once told by a chief constructor that in designing the steering engine compartment of a second-class cruiser years ago he had arranged a large trunk at the forward end to supply fresh air, taking it in the course of the natural drift from forward aft, expecting that the uptake would be through a shaft further aft to a cowl on the poop he provided. But in fact the ventilation went the other way. The trunk forward was the uptake, and whenever the door into it from the space under the poop was opened, the officers' quarters were flooded with oily smell. Why? Well, he explained it that the trunk was at the fore end of the compartment, close to the warmer bulkhead next the engine-room, and that just under the trunk was the blazing hot steam-pipe to the steering engine, so the air thereabouts was greatly heated and insisted on rising at once through the trunk, compelling air to replace it to come down the after shaft. The principles of ventilation were being obeyed by the unconscious air, just as much on board ship as ashore, but in the planning of the complicated structure of a ship, too little consideration had been given to them.

Another example of apparently perverse ventilation may be quoted from my last ship at sea. To ventilate her mess deck in a head sea, with all hatches and sidelights forward shut, it proved best to take the air in aft and let it out forward. The head wind as it blew aft got caught against the after screen, and, and banked up there, much of it escaped down the hatches and streamed forward along the main deck. One such day, when the sea was lessening, the captain shipped a cowl, with its back to wind and sea, on the fore bitts right forward; this acted as an exhaust, relief of pressure occurred, and splendid ventilation of the mess deck and main deck was established, not as one would expect from forward aft, but from aft forward.

In all navies nowadays[5] ships are so divided up by bulkheads that natural ventilation and windsails are becoming things of the past. The ordinary forecastle of merchant ships, the place where the crew live, is by no means an easy place to ventilate. Forecastles are generally two in number, for the sailors to starboard, for the stokers to port. They are roughly wedge-shaped, each like a right-angled triangle, the side-lights in the hypothenuse, the door either in the base or in a little recess excavated at the base end of their perpendicular sides, between the two forecastles; this is preferable. They have been greatly improved in recent years; this improvement is to be traced through Dr. W. Collingridge's paper in THE LANCET of May 5th, 1894, p. 1111; Romeril's book on "Sanitation in the Mercantile Marine," 1898; and Dr. Wright's paper in the Journal of the Institute for 1904, p. 442. The evil-smelling forepeak is no longer entered through the crew's quarters; the paint store is cut off by an air-tight bulkhead, and its door is on the upper deck. The hawse pipes or cable pipes are often air-tight, more often than formerly; still the need for good ventilation remains clamant. Many a forecastle one has visited in which the atmosphere was more oppressive than one would expect to find in a bad back-to-back house. The men need only have 72 cubic feet each, and in this in harbour they are all eating, smoking, and sleeping. By-and-by, when these ships wear out, everyone will have 120 cubic feet. As to ventilators, they are small, perhaps only one, sometimes there are two, but always opening overhead, never carried down to the deck. There is also in cold weather the chimney of the stove, and there is the door, usually so close to the stove that the air-supply of this latter comes from the door and does not draw foul air out of the forecastle. Then

[4] THE LANCET, May 1st, 1909, p. 1233.

[5] For the American Navy see Gatewood's Naval Hygiene, for the German Navy see their Health Report for 1906-07.

there are the sidelights, generally of necessity closed at sea, and not opened in harbour because so small, the air coming in through them would do little good. It is difficult to find places for ventilators, space on the top-gallant forecastle overhead is very small. In one small ship I saw there was an 8-inch cowl for the seamen's mess-deck, right forward; there was none for the stokers, for where that would have come up, beside the steam capstan, a man had to stand to work the capstan engine. As the mate said when I suggested another ventilator: "There isn't much room up here when we have wires all over the place and are working in the dark." I would suggest a goose-neck ventilator right forward, 6 inches in diameter, continued down to within a foot of the deck for supply of air, and an uptake, also 6 inches, as far aft as possible, just to open through the roof for an uptake. With the stove lighted and the door and sidelights shut both would act as inlets. This latter ventilator might be replaced in some ships by an opening in or over the door. Ventilators are not much good if they have to be closed at sea; but there are water-excluding ventilators like Utley's, so widely used for cabins and holds; they are very reliable. I was told when taking passage in the *Campania* that they never give any trouble or got out of order; I have never chanced to see one in a forecastle.[6] They are expensive and they do increase weight but are helpful; and ventilation saves money. Dr. S. Barwise, in the *Journal of the Royal Sanitary Institute* for January, 1889, notes that a large mill at Blackburn had increased its output 2½ per cent. since they had put in adequate ventilation, and the opinion of the owner was that the expenditure had been a wonderful investment. Also Carnelley found that £20 spent annually in mechanical ventilation for 1000 scholars gained £125 improvement in government grants; and you know what Parkes told us about horses, and what I heard about horse ships.

An Utley ventilating side-light is supposed to be equivalent to 15 square inches of ventilator in the deck; they must be good or there would not be 600 in the *Mauretania* and *Lusitania*, where it is so expedient to cut down weights. Besides, there are other water-excluding ventilators, as Sugg's.

If forecastles were kept clean they would need ventilation less, but the first step towards getting them cleaner would be, in my opinion, to give them more light by fitting larger side ports (that means probably heavier frames and stronger scantlings). Then take the bunks away from the side of the ship, where they obstruct the light and involve greater risk to the crew in some cases of collision. To put them against the inboard side would probably, however, mean enlarging the forecastle. In a German ship I have seen the bunks arranged like the teeth of a comb. After we have got larger side-lights and the bunks away from the ship's side, if we could get the exposed surfaces of iron covered with varnish and cork it would be well, or they might be cased in wood. Then if that wood were smoothly finished and painted white the men could see the dirt clearly, and in a year or two great improvements would be noted. The stone, brown, and grey paint I see do not force people to wash them, and give them little satisfaction when they do; whitewash I think positively degrading.

Crew accommodation is, I am glad to see, being put aft. The most commodious crew space I have seen was in a huge cargo boat in London, under the poop. The best crew space I remember was in quite a small Swedish timber-carrying steamer. It was aft, and under the upper deck. It was wood-lined all round and overhead, painted white enamel. The berths were, it is true, round the ship's side. They had larger cubic space, electric light, and, most marvellous of all, I must mention it though outside my present subject, a fixed washing basin with a four-gallon supply tank over it. It gave me an idea of comfort, that crew space, I have never felt before. This Swedish ship had also the best water-closet for the men I have seen, just as it might have been for passengers, and kept clean. Owing to position there could be no ventilators through the deck, and they would have been useless even if fittted, because under the deck cargo of wood the ventilators were in the panels. If the ship is to be wired for electric light the ventilation is quite simple: estimate for an extra lamp and replace it by a propeller fan, and put it at an opening in the bulkhead to extract the foul air as in a laundry. The usual employment of a table fan, to make an eddying of the air round the compartment, does little good to ventilation. The ventilation requirements of forecastles would be further reduced if wash places were separately installed, as contemplated by the Merchant Shipping Act of 1906; there would be less drying to be done by the air, and then if they only had good water-closets, merchant seamen would be no worse off, unnecessarily, than their brothers who are housed under the conditions generally prevailing ashore; their discomforts would then be only those essential to their employment.

The stokeholds of ships can be generally well ventilated everywhere if baffles are fitted to distribute the cool air through the whole space, for each 30 pounds of coal burnt in an hour brings down enough air for a man, but the bunkers where the coal-trimmers work are a problem. The engine-room is also a difficulty, for it has no through draught, and very hot "pockets" occur. I remember what seemed a tragic irony, an engineer in the merchant service getting heat stroke when attending to the refrigerating engine, which was in one of these backwaters. The principle is to exhaust from the hottest places by fans and shafts.

Various alterations of air occur in holds, best detailed by Nocht. We are all thinking of ferro-silicon, but that is a very special case I cannot touch. The risk to crews from offensive cargoes is nowadays much decreased, as bulkheads are iron and watertight. Nocht notices that there may be danger in entering newly-opened (and ill-filled I would add) holds, for certain cargoes of moist cellulose—e.g., rags, cotton, and paper—absorb the oxygen, and replace it with carbonic acid and perhaps marsh gas. This forms an explosive mixture with air when there is about 10 per cent. of it present. Maize and oats are apt to "heat," and coal sometimes spontaneously ignites, this latter event being usually heralded by a smell of ammonia. Ventilation is required to keep these processes in check and to keep the temperature down. This is managed sometimes by fans, and sometimes by shafts with cowls. I wonder why it is not sometimes done on the lines of the old experiment with a burning candle in a bottle with a long neck. If a diaphragm was slipped into the neck of the bottle ventilation was established, the up and down current no longer interfering with one another; if the diaphragm was removed the candle went out. If a temporary bulkhead or screen were fitted through the hold amidships, leaving a couple of feet clear below, air to get from one side to the other must pass all the way under that screen. A ship is hardly ever the same temperature both sides (action of sun and wind); if the two halves of the hold were separated the air on the sunny side rising would have to be replaced by cold air from the other, which must pass all through the cargo and the hold. At present I expect the change only occurs in that part of the hold upon the water line. It would be most useful in ships carrying grain in bulk or in bags. The hoped result would follow; I think so from Dr. Shaw's pregnant remark,[7] "Nature provides without difficulty a convection current wherever air is locally warmed." As the temperatures have little difference the currents would be slow, consequently the resistance would be small, and we might be able to make them come to our advantage, from farther away.

Ventilation would also save money if applied to holds while they are being stowed. It follows from H Wolpert's observations (reported by Prausnitz) that a man who sweats as he works is doing less good work than if he were supplied with air, so much and so dry as to prevent the sweat from appearing. If air, then in volume to prevent this sweating, were supplied to the holds they would be stowed more quickly, and the ships get away the sooner. An electrically-driven fan at the top of the hatch with a long and large discharge pipe is what is wanted, for with a pipe double the diameter the same power will send down four times the volume of air.

In the artificial ventilation, both of ships and houses, some people prefer the plenum, some the vacuum system, and the systems are sometimes (as happens with the sexes) fitted against one another as rivals. In fact, they show to much greater advantage when working together. If there is only one system, the pressure required to carry the air through

[6] Fleet-Surgeon (now Deputy Inspector-General) W. Talt mentions (Journal of Royal Institute of Public Health, 1905) that they were fitted in the new Royal yacht and there acted "most efficiently."

[7] Shaw: Air Currents and the Laws of Ventilation, 1907 p. 41.

the whole area must be raised twice as high above the normal as is necessary when the air has only to be forced halfway and to be sucked the other half; consequently the installation of power for the combined system is cheaper and the opening of doors and windows produces a merely local effect, whereas with a "single" system it may ruin the ventilation altogether if a window is opened in a tactless place. The Glover-Lyon appears to be an excellent example of the combined system; it emphasises the need for many apertures in order to prevent draught and the advantage of making large apertures. The trunks should be so arranged that they can be cleaned; the efficiency of ventilation may easily fall 20 per cent. through deposit of fluff on the sides. Besides, we all heard how streptococci fell out of the ventilators in that convalescent home at Broadstairs.[8] The trunks should also be as large as possible, for to double the supply costs nothing after the area of the shafts is doubled, the power will remain the same, but to get a double supply with the same shafts as before we must multiply the power by eight.

Extended accounts of the ventilation of the very largest passenger steamers have been given at intervals in the last three years by the Special Sanitary Commissioner of THE LANCET. The Cunard Company warm the *Mauretana* by hot air from thermotanks standing on the uppermost deck of all; these supply air to all parts of the ship, while the offices generally are exhausted by trunks leading to the funnel casings. The White Star warm all parts of the *Adriatic* by steam radiators, supply no fresh air, but extract the air from saloons, cabins, water-closets, and lavatories by fans. The ships of each company are plentifully supplied with Utley porthole ventilators.

The ventilating mechanisms are specially three: the thermotank, the sirocco fan, and the Utley ventilating sidelight.

The thermotanks, of which there are 65 in the *Mauretania* (situated, as I said, on the topmost deck), collect the purest air, warm it, and pass it through a fan at a temperature regulated nowadays automatically within 2°, and so it passes to the area of distribution. This machine can also be used as an exhaust, and prides itself that disinfecting gases can be distributed by its agency.

The sirocco is a fan, in principle quite distinct from any that preceded it, quite distinct from any of the flat or propeller fans we know so well. It is a multivane fan, has somewhat the shape of a tall hat, the 64 narrow vanes, each with a parallel twist, are arranged up the side of the hat, while the middle is empty. The ordinary fan takes air in and accelerates its motion in the same direction. The sirocco fan takes it in at the centre of the hat and throws it out at right angles round the periphery. For the same ventilating effect this is much smaller and lighter than the old fans, and uses up much less energy, hence its existing great popularity.

The Utley porthole ventilator (or, as they call it in Germany, the Utley "swimmer" or float) is essentially a passage over the top of the sidelight or scuttle, defended against the waves by cork floats, which are pressed by the waves against a seating so that no water can get through. As the water falls away, down come the corks, and the gangway for air is again left clear. I described this mechanism in THE LANCET of June 7th, 1902, p. 1597, where there is a figure.

The statistics of the ventilation in these large ships are interesting. There are in the *Mauretania* 65 thermotanks, each capable of supplying 33·3 cubic feet per second; this is in all a little over 9 tons of air supplied to the ship a minute. It looks very large, but does only work out at 800 cubic feet of air supplied every hour, artificially, to every person on board, and there is, besides, the natural supply through the Utley sidelights. The ventilation inlet in the cabins is 20 × 8 inches; 800 cubic feet will pass through this in an hour at a velocity of ¼th foot per second. This will cause no one discomfort from chill. This good ventilation, as Dr. Nocht remarks, draws passengers, and so is profitable to the owners. To this I need only add the wise conclusion of Dr. Collingridge: "The more comfortable and cleanly forecastles can be kept, the more contented and happy men are, the longer they will remain in the ship, and the more work can be got out of them."

[8] Brit. Med. Jour., March 23th, 1910, p. 770.

Clinical Notes:

MEDICAL, SURGICAL, OBSTETRICAL, AND THERAPEUTICAL.

HYOSCINE POISONING: PILOCARPINE AN EFFICIENT ANTIDOTE. A MAXIMUM DOSE.

BY T. GODDARD NICHOLSON, M.B., B.SC. LOND., M.R.C.S. ENG., &C.

THE patient, a five-year-old boy, in response to an urgent summons, was seen by me in an unconscious condition, coupled with wild erratic convulsions of the limbs and face, the eyes, however, being fixed. Both pupils were widely dilated and the fundi seemed normal. There was no response to tactile or painful stimuli nor to bright light. The temperature was 100° F., the pulse bounding at 124 per minute, while the skin was hot, dry, and flushed. I catheterised him and obtained a small quantity of urine. I could obtain no history except that of a sudden onset after having had his evening meal of simple food some two hours previously. I ordered him at once a hot bath and mustard stupes to the back of his neck and soles while I returned for a stomach siphon and to test the urine. The latter was free from albumin and sugar. On my return the similarity of his condition to poisoning by the atropine group of alkaloids struck me, and as the belladonna plant grows in the locality I injected at once a quarter of a grain of pilocarpine hydrochloride. Within 10 minutes the condition improved, and by the next morning apparently a complete recovery was determined. All inquiries failed to discover the source of poisoning, and I was disposed to regard it as an autotoxæmia when three days subsequently the father brought me a tube which had contained tablets of 1-100th grain of hyoscine bromide and which the boy had found near his school. He had shared such as it contained as comfits, the larger portion (four or five) being taken by himself previous to the attack.

Regarding the maximum dose I may report the following incident. When engaged in the exploration of the Loangwa Valley in North-East Rhodesia during 1896 a witch doctor and his chief were captured by our Angoni and Atonga askari for having burnt live infants in the practices of their craft. They were tightly bound and conveyed to the base camp on the Loangwa foreshore. Their imprecations and ravings made night hideous, so much so that the indunas wished to kill them there and then. I promised to quiet them, and injected into each (both being big Sengas) the fortieth part of a grain of hyoscine hydrobromide. Within 15 minutes both were soundly anæsthetised, only slight twitchings of the extremities distinguishing their condition from that of sound sleep. So much so that their guards loosened their bonds, and in the early morning both bolted into the wilderness. Whether they escaped or were knobkerried by the infuriated Angoni (who are not torturers) I failed to discover.

Great Marlow.

NOTE ON A CASE OF HÆMORRHAGIC DIARRHŒA ACCOMPANIED BY GREAT EMACIATION.

BY J. GILROY, M.B., C.M. GLASG.,
MEDICAL OFFICER OF MIDDLEBIE.

ON May 13th, 1909, I saw a man, aged 23 years, who had been sent home from an adjoining town as unfit for duty. I attended him after this date up to the present time. Previously to his arrival home he had had medical attendance and was told he was suffering from dysentery, and a milk diet had been enjoined upon him. He gave me the impression of a person suffering from oligæmia. His temperature was over 100° F. During the daytime there was a hectic flush on his face. Pain in the abdomen was complained of, as also were hæmorrhoids. Stools were frequent; indeed, diarrhœa and bloody offensive motions were his great complaint. The motions, I found, were very offensive, and the hæmorrhage was profuse. On examination he had perceptible pain in the region of the left groin, and warm bran and salt bags, alternated often with a linseed poultice, were applied

from the day I first saw him, so constant was the pain as a symptom. The hæmorrhoids I found to be very trivial. I considered at first examination whether I might excise one prominent pile, but there was nothing indicative of any rectal state to show it as the seat of the dark and persistent bleeding. The usual remedies were ordered—pulv. ipecac., co. bismuth and ipecac., &c.—and persevered in. Eggs, milk, soup, and fish were allowed for a dietary.

I attended the case daily; it proved a very prolonged one. Indeed, his decubitus was unfavourable all through; it was as if pitched into bed. His tongue kept febrile and was covered with a creamy white fur. As up to August no improvement was noted I felt uneasy and cast about for extra remedies. I bethought myself of carrageen, or Irish moss, which proved a happy idea; it pleased the patient and ministered to his requirements as a food and as an astringent. I feel sure it is nutritious and is a useful agent in these diarrhœal states.

Passing on to August, 1909, the patient's state was bad. He was reduced in condition, bony prominences being ominously distinct. He got weaker, and in September was apparently sinking, when I decided to try tuberal, a serum I have used fairly often in my practice, particularly in cases of psoas abscess. The serum is Dr. Thamm's of Berlin, and I ordered in this case seven drops in the morning fasting, to be taken in some new milk. In November my note-book chronicles an improvement. It was admitted by the patient himself that his progress after this was slow but was in the right direction. His tissue development increased in a very gratifying manner. He is now at this date (August 29th, 1910) visibly putting on flesh and is getting really stout. He has not left bed yet for any length of time. He sits up and reads a little. Asking him, "What about the bleeding now?" he replies, with a breath of something bordering upon contempt, "There's none now." Surely a very pleasant result.

Ecclefechan, N.B.

MURDER BY MORPHINE AND CHLOROFORM; SUICIDE BY ILLUMINATING GAS.

BY A. E. L. CHARPENTIER, M.D. DURH., D.P.H.,
MEDICAL OFFICER OF HEALTH TO THE UXBRIDGE RURAL DISTRICT COUNCIL; MEDICAL OFFICER TO UXBRIDGE PARISH; SURGEON TO THE EDUCATION DEPARTMENT, THE POST OFFICE, AND THE METROPOLITAN POLICE.

CHLOROFORM is so rarely used for homicidal purposes that the following case may be worth putting on record for scientific and forensic reasons, although the events can no longer be called recent.

On June 18th, 1906, at about 5 P.M., I was called by the police to a cottage. On arrival the smell of gas was overwhelming. We opened all the windows and turned the gas off at the meter. On entering the front bedroom a woman, two children, and a man were observed lying on the bed. The woman and children were in their night-clothes in the bed, and over their faces was a large piece of cotton-wool, still smelling of chloroform. The noses and chins were blistered. They were dead but quite warm. The man was partially dressed, lying outside the bed-clothes breathing stertorously. His lips and cheeks were bright red coloured, and the pulse was rapid and feeble. He was carried out of the room, a hypodermic injection of strychnine was given, artificial respiration was performed, and oxygen was administered. His condition improved sufficiently for him to be moved on an ambulance to the infirmary, where he died about a week later from pneumonia.

In the bedroom I found a pint bottle containing a few ounces of chloroform; the gas bracket was broken from the wall, and a V-shaped cut was seen in the metal supply-pipe. Downstairs we found an egg-cup containing a little milk with a white deposit, and a dessertspoon containing a similar substance. A hypodermic pocket-case, supplied with the usual set of tablets, was on the table.

The necropsies on the woman and children.—In each case the post-mortem appearances were similar. The bodies were well nourished and all the organs were healthy. The hearts were pale and flaccid and the left side contained some clot in the two elder subjects, while in the case of the younger child the heart was full of clot. The bladders were fairly full of urine. The liver, stomach, kidneys, and urine were sent to the late Sir Thomas Stevenson in jars, sealed. He reported that there was a trace of chloroform in the blood and fluids of the bodies. In the organs of the woman he found three-quarters of a grain of sulphate of morphine, showing that more than a fatal dose had been administered. In the elder child he found half a grain and in the younger child one-third of a grain of morphine. He came to the conclusion that the three persons had died from chloroform and morphine poisoning, but could not say which drug actually caused death. The powder in the egg-cup and spoon was found to be sulphate of morphine.

It was shown at the inquest that the whole family went out for a drive in the afternoon. The bladders containing so much urine showed that the woman and children must have gone to bed early, possibly after the man had administered the morphine in milk. After they had gone to sleep he killed them by means of the chloroform, then, having cut the gas-pipe, he lay down to die with them. The man was a chemist and probably was aware of the impossibility of administering chloroform against a person's will or in ordinary sleep. Evidence produced at the inquest showed that he was insane.

Uxbridge.

Medical Societies.

ROYAL SOCIETY OF MEDICINE.

Vaccine Therapy.

A DISCUSSION upon Vaccine Therapy was inaugurated at a meeting of the Royal Society of Medicine on May 23rd by Sir ALMROTH WRIGHT. The opening address will be found on p. 863 of this issue of THE LANCET, and we subjoin here a brief summary of the debate that ensued, which will, we are glad to say, be published shortly in full in the Journal of the Royal Society of Medicine.

Sir WILLIAM B. LEISHMAN said in connexion with typhoid vaccine that in their efforts to improve typhoid vaccine—if that were possible—they had experimented with a large number of alternative vaccines. They had done that for some years now, and had come more and more to the conclusion that the phagocytic index was the most reliable test of the value of a particular vaccine. In regard to the ingestion of vaccines as being a possible alternative to inoculation, it was concluded that it was certainly possible to modify the amount of protective substances in the blood by giving vaccine in this way by ingestion, but the results were extremely irregular. The use of typhoid vaccine, not as as a prophylactic, but as a therapeutic measure in enteric fever, had been suggested often, and had been tried in various places. They had treated some cases with ordinary prophylactic vaccine. So far they had only got a comparatively small number of cases, but they were distinctly encouraging. In the ward in which cases were treated there was complete absence of the typical typhoid facies in the patients; they were rosier, seemed in good condition, and felt better. He believed vaccine treatment to be the greatest step forward that medicine had made of recent years and that it had immense possibilities before it. One of the most important keys to successful treatment was the question of dosage, and he did not see how to arrive at the appropriate dosage in the absence of frequent estimations of the opsonic index.

Dr. ARTHUR LATHAM said that vaccine therapy was a great addition to their methods of treatment, but that did not mean that it would displace the whole fabric of their clinical knowledge. He would say that from his own experience he was certain vaccine therapy did good, and he was equally certain it was capable of doing a great deal of harm if it was given in an unskilful fashion. He was in entire agreement with previous speakers in believing that a knowledge of bacteriology was essential to the clinician of the present day. He was equally of the opinion that the place for the bacteriologist was in his laboratory, and that the bacteriologist without clinical knowledge was out of place at the bedside. In the experience of them all staphylococcic infections yielded in most cases to appropriate vaccines, but even there failure sometimes occurred, and it might be added failure was more common if they confined their methods entirely to the use of

vaccines. There could be no question as to the value of vaccines in chronic pneumococcic and gonococcic infections. Their experience did not justify so dogmatic an opinion on the part likely to be played in the future by vaccination in acute pneumonia. Tuberculin was a most potent remedy. At the same time it could not be too emphatically stated that it was capable of doing irreparable damage if it was used without adequate knowledge and guidance as to dosage and spacing of doses. It was certainly more successful, or at any rate more rapidly successful, in non-pulmonary forms of the disease than in the pulmonary forms. He had seen what appeared to be permanent "cures"—that was to say, "cures" which were maintained for two years and upwards—in most desperate cases. Thus, three cases of acute tuberculosis under his care had recovered, in two of which there were no localising signs, and in one of which the patient suffered from tuberculosis of the peritoneum, hip-joint, knee-joint, shoulder-joint, and pleura, with fever to 105° F. In all the diagnosis was made by clinical methods and confirmed by means of the opsonic index. All three patients are without any evidence of ever having suffered from tuberculosis to-day, some two years or more after treatment. Tuberculin appeared to be a specific in any form of tuberculosis where there were no localising signs, and merely the symptoms of the disease were present, the diagnosis being backed up by a positive finding with the opsonic index. With regard to pulmonary tuberculosis, his experience was that they were faced with more severe limitations for vaccine therapy than in the non-pulmonary forms. In long-standing cases with fever they usually failed in the great majority of cases to effect permanent good; in some they did harm. The same was true of very acute cases. In both classes, however, they saw some striking instances of improvement which should be attributed to tuberculin rather than to coincidence. In early cases of pulmonary tuberculosis, and in chronic cases without much fever, his experience was that tuberculin was most valuable, and bore out the experience of other observers on the Continent and in America. The most striking statistics in that connexion were those of Ritter of the Edmundsthal Heilstätte, Hamburg, who, it should be mentioned, was using infinitesimal doses of tuberculin many years ago. In regard to the administration by the mouth, the method he employed was to give the vaccine suspended in a fluid isotonic with the blood on an empty and healthy stomach. To ensure that it was best to give the vaccine first thing in the morning. It was doubtful whether any appreciable quantity of gastric juice was brought to bear on a vaccine if it was given in that way, and, even if it was, no appreciable alteration occurred. It was stated that they could not trust oral administration because absorption must differ from time to time, and that one and the same dose in a given case might at one time be too small and at another too large. In answer to that he would state that clinical experience proved the contrary. He did not restrict himself to that method of administration. He often used the hypodermic method, especially when the stomach was disordered and the tongue furred. The oral method undoubtedly had great convenience on its side for the use of vaccine therapy in large institutions or in general practice. It was apparently probable that they would soon be able to cultivate the tubercle bacilli of consumptives by an easier and quicker process. If that occurred they would have an autogenous vaccine, and they would have better and quicker results. They were told that when the opsonic index remained level and within normal limits they might be satisfied with the immunity produced. Clinical experience did not bear that statement out. Certainly, in his experience relapses were much less common if the administration of vaccines was continued long after immunity had apparently been established. The greatest limitation of all would be the fact, if true, that vaccine therapy necessitated the use of the opsonic index as a guide. They seemed to have forgotten the enormous number of patients for whom such facilities were, for one reason or another, an impossibility. If the opsonic index must be used as a guide then the application of vaccines must be greatly restricted. They found one set of bacteriologists full of enthusiasm for the opsonic index of all organisms. They found others, perhaps in the same laboratory, who confessed themselves unable to give a reliable reading for the pneumococcus or the micrococcus catarrhalis. Criticism of the work of a great man often appeared ungenerous, but he must state his opinion that Sir Almroth Wright was wrong in his contention that the opsonic index was the only real guide that they had for vaccine therapy. His contention might, indeed, retard advance in the subject. It was clear that there was a definite relation between the opsonic index and the clinical symptoms and temperature, and that both could be used as a guide to the immunising process. His experience convinced him that clinical observation formed a good, and in most cases an efficient, guide for vaccine therapy. A dose of vaccine which was followed within 24 hours by a rise of temperature or an increase in the fluctuation of the temperature, and by an aggravation of symptoms, was too large. A dose which had no effect on the temperature or the symptoms was too small. A dose which was followed by a lowering of the temperature, or a diminished fluctuation of the temperature, and an improvement in the symptoms did good. When the effect of such a dose became less the dose should be increased in size. Those were simple rules, but they required careful observation and judgment. The best results of vaccine therapy, or indeed of any application in clinical medicine of the allied sciences, must come from the properly coördinated work of the clinician and the laboratory worker.

Professor R. T. HEWLETT said with regard to pulmonary tuberculosis he was very uncertain as to the value of vaccine therapy. He thought pulmonary tuberculosis could be divided into three classes of cases. There was one class which, even if the conditions were but moderately good, tended to do well. There was a second class which, if very well looked after and well treated and put under good conditions, also tended to do well. There was a third class which, do what they could, went downhill. And in this last class there were cases which ran a very long course—ten years, perhaps 20 years, with remissions. So it seemed extremely difficult to be sure as to whether tuberculin treatment was of service in pulmonary tuberculosis. With inoculation, accidents had sometimes happened which made one wish that oral administration could be adopted. Vaccine therapy was a somewhat clumsy imitation of Nature's methods of curing disease. The fact that the culture was sterilised by heat, for example, must necessarily destroy properties which were possessed by the living microbe. He suggested that probably microbial endotoxins might be more potent than sterilised cultures, and that their use was at least worth a trial. There was Besredka's method, which, according to him, was extremely successful for *prophylactic* vaccination, at any rate; it might be extended to vaccine therapy—namely, the treatment of microbes before injection with an immune serum; in other words, sensitising the microbes. Besredka claimed that *prophylactic* vaccination by this method gave results which were superior to the simple injection of bacterial cultures. Professor Hewlett thought that it was questionable whether the opsonic index method was going to be generally applicable. It also seemed that in a great many cases at least it might be done without by carefully noting the general clinical condition. But if you were going to have the opsonic method it must be done by someone whose technique was beyond reproach.

Mr. K. W. GOADBY made some remarks on the treatment of those diseases which affect the mucous membrane of the mouth and gums.

Dr. A. WHITFIELD said that as regards the value of the opsonic method for diagnostic purposes he was thoroughly convinced of its utility. What he might call an ultra high, an ultra low, or a variable index might be regarded as a sure sign of infection, though it might not show the prime cause of the disease. Further, if the index were taken on one or two occasions, an inoculation of the suspected organism given, and the index were found to exhibit a sharp fall, followed by a rise, they might be very positive that they were dealing with a case of infection with the organism inoculated. It was especially in tubercle that the defenders of the treatment regulated by the index said that one must always rely on this as a guide. He admitted that he held that view for a considerable time himself, but that was in the earlier days of his opsonic work. Sir William Leishman told them that in his investigations on the subject of typhoid inoculation he had found that the opsonic index was the most reliable guide as to the potency of a vaccine, but that was not the same as proving that the effect was directly an immunising one, merely showing a lasting disturbance of the serum. He did not think that he had yet evidence proving that those vaccines

which disturbed the opsonic index most had conferred the greatest immunity. Lastly, he wished to deal with the statement that the doses used had been determined by the opsonic index. This was entirely erroneous. The first doses before any opsonic variations were noted as the result of injection were obviously not so determined. He had also carried out an investigation of the opsonic index in a short series of cases which had been treated by the old method of giving massive doses of tuberculin R, and, although some of the indices were high and others low, none were strikingly either high or low, and it was absolutely impossible for him to diagnose from his results which of the cases was doing well and which badly. He entered an earnest plea for accurate and patient work in the proof of the causal relationship of every organism before it was used as a vaccine. That must often entail a careful research by both a competent histologist and a skilled bacteriologist. In one disease two different cultures were used for making what purported to be the same vaccine, which he was quite certain were completely independent organisms.

Dr. A. BUTLER HARRIS said that it was as important nowadays for the general practitioner to be able to work out the simple pathogenic infections which occurred every day in his practice as to be able to set a broken arm. He did not think the supplementary position of the bacteriologist to the clinician was desirable, either in the interests of medicine or of the scientific advancement of the individual. If vaccine therapy was to take the right place as the handmaid to both medicine and surgery, every practitioner, whether specialist or general, must of necessity be expert in rudimentary bacteriological technique. To condemn vaccine therapy in pneumonia because it was powerless to check a virulent invasion after the whole organism had been overrun was illogical and unreasonable. He thought the time was not far distant when results would show that the pneumococcus vaccine was to pneumonia what the diphtheria antitoxin had proved to be to diphtheria. With reference to tubercle, his experience in inoculating in phthisis had not been encouraging. Though carried out under the most rigid conditions of opsonic regulation, he had failed to produce better results than occurred with simply perfect resting conditions, such as Paterson had described.

Dr. J. KINGSTON FOWLER said that vaccines had been used for a long time in his wards at the Middlesex Hospital in all cases in which their employment appeared likely to be beneficial, including malignant endocarditis, bronchiectasis, pulmonary tuberculosis, gonococcal arthritis, some pneumococcal infections, and cases of catarrhal affections of the bronchi. He had had more considerable experience of the use in pulmonary tuberculosis of tuberculin, both in the manner of 1890 and in the fractional doses used in recent times, but he had not yet seen a case of that nature in which he was sure that benefit had been derived. He hoped, however, that he had still a mind open to conviction. The great advances of medicine in recent years had been made by the bacteriologist and not by the clinician, and he, at any rate, was anxious that the bacteriologist should have his full share of the credit. But nothing would, in his opinion, ever fit a man for the treatment of disease but clinical experience. No man could shut himself up in a laboratory for years and then come forth equipped for the treatment of disease.

Mr. S. MAYNARD SMITH said that he was a strong believer in the merits of vaccine therapy, because he had been able to show, to his own satisfaction, that he had had better results in certain surgical lesions treated with the aid of vaccine therapy than he had had in similar cases treated on the previously existing lines, without the aid of vaccine therapy. The surgical limitations included the fact that vaccine therapy could not give rest. Rest was as essential as it ever was in the treatment of tuberculous joints. Failing rest, the patient would be getting inoculations from his own joint; and therefore inoculations given by the vaccine therapist were likely to be interfered with, and their effect ill-regulated. Further than that, one might increase the opsonic power of a patient's serum with vaccine, but one could not make that vaccine penetrate to the middle of a tuberculous abscess. He knew tuberculous abscesses might sometimes clear up under vaccine therapy; they sometimes cleared up when not treated at all.

Dr. T. J. HORDER said that his own experience included so many successful cases that his impression of the great value of vaccine therapy was a very deep one—so much so that he should consider he was denying patients their best hope of recovery in a large number of infective conditions if he did not employ this principle of treatment. But the original claims of the bacteriologist were too extravagant. Here was a panacea at last. No need now for fresh air in the treatment of phthisis; London slums would serve, provided tuberculin and the opsonic index were available; the surgeon's art was now defunct—suppurations needed no knife, and even dread cancer promised to yield promptly to the immunisator's power. To-day the phthisis sanatoria were full, and some of the inmates were sent to them by immunisators themselves. And he saw no sign of diminished activity amongst surgeons. Five years ago, and even much later, it was taught that opsonic-index estimations were essential to vaccine treatment; indeed, without opsonic-index estimations it was held that he who used vaccine therapy acted dangerously, almost criminally. But to-day what did they find? The facts of vaccine therapy had outgrown the hypothesis of the opsonic index—a big argument in favour of the efficiency of vaccines. Many who originally held that the opsonic index must control the treatment, themselves employed vaccines in large numbers of cases successfully, with no such mechanical control at all. He thought they explained that by saying that the opsonic index had taught them what doses to give in certain cases. The clinician considered himself justified in rejecting this explanation. The cases were never sufficiently alike. If the index was necessary once it was necessary again. He regarded the doctrine of the opsonic index as the great, almost the sole, artificial limitation to the use of vaccine therapy. Vaccine therapy was an effective method of combating an important factor—it might be the *most* important factor—in the struggle between the tissues and many infecting agents. He believed, however, there were other factors in this struggle which were not touched by the use of the vaccines, and that this natural limitation did exist, though at present it was quite undefined.

Dr. D. W. CARMALT-JONES said that he had been associated with St. Mary's Hospital Inoculation Department for nearly four years, and he had seen some remarkably fine results; but no impression of unvarying success was left upon his recollection, and he feared that anyone who embarked upon vaccine therapy in that hope was laying up for himself considerable disappointment. He thought some very obvious limits were set to the usefulness of purely antibacterial treatment in disease, particularly in such a disease as tuberculosis, in which large areas of necrotic or caseous tissue occurred. No blood-vessels passed through such tissue, and blood serum containing 50 times the normal amount of immune bodies would produce no effect upon it. It might be laid down as an axiom that all sources of irritation should be removed at the outset of treatment. Vaccines had no power whatever to remove them, and they must be removed by surgical methods.

Dr. F. RUFENACHT WALTERS said his experience of vaccine therapy was almost entirely confined to the treatment of cases of pulmonary tuberculosis or phthisis in a sanatorium. Many of these recovered promptly and satisfactorily under the ordinary sanatorium methods, but there were many others that did not do so. In many cases the fever persisted or recurred and the treatment was therefore exceedingly tedious and apt to lead to much destruction of lung tissue. These he now believed to be chiefly, perhaps entirely, cases of mixed infection. Here one required something more than the ordinary hygienic methods adopted in sanatoriums. Treatment by antipyretics was apt to be disappointing, and he thought it was especially in this class of case that vaccine treatment was likely to be of considerable service. Until comparatively recently, owing to considerations of expense, it was only exceptionally that he employed vaccine treatment other than tuberculin; but lately he had been treating all the obstinate cases, and all those with high fever in which the existence of mixed infection was proved, with corresponding vaccines. His results were, to a very large extent, too recent to deal with now; he would have to leave many to a future occasion. Tuberculin, however, he had been using for longer chiefly in small fractional doses. Some people were of opinion that highly febrile cases of tuberculosis should not be treated with tuberculin, believing it to be a dangerous practice; but such was not his experience. He thought it was very largely a question of dose. Dr. Latham had pointed out that the appropriate minute doses of tuberculin

would bring down temperatures in febrile tuberculosis, and he could confirm that. He thought if they started with a tiny dose and felt their way—he was in the habit of relying partly on the opsonic index and partly on other considerations—they would find a dose which would reduce the temperature. There were, he believed, two classes of cases in which tuberculin was likely to be of service—those in which even the slightest exertion caused an overdose of auto-inoculation, and those in which a large amount of exercise had but little immunising effect. Another point was the administration of tuberculin by the mouth. He had seen several cases in which the method had been most successful, and many in which it had done some good without any ill effects. But there were two drawbacks which were sometimes met with. There were cases in which it caused digestive disturbances, such as pain in the abdomen and nausea; another drawback was the uncertain effect of a given dose.

Mr. W. DEANE BUTCHER said that the hypothesis of electro-vaccination or radio-vaccination had gradually grown up to account for a number of phenomena otherwise inexplicable. The first thing that led to the suspicion of the possible vaccinal action of the Roentgen rays was the fact that a number of skin diseases of totally different origin and nature seemed to improve under exceedingly small doses of the irradiation. The strongest evidence of the vaccinal action of electrical treatment was derived from a consideration of the various modes of attack on rodent ulcer. In the whole purview of medicine there was nothing more impressive or more certain than the cure of a small rodent ulcer by electrical methods. But the cure may be effected in many ways—by Roentgen rays, by radium, by ultra-violet light, by the high-frequency effluve, or by zinc ions. What was the common factor in all those cures?—cure, he said, for the process was not one of destruction but of repair. It was not merely a bactericidal action, nor was it merely a selective destruction of tissue. It was a biological recoil, the resentment of the cells of the organism to the insult of the ethereal vibration. The habitual defence of living cells to such an insult was exactly the same as that to a bacterial invasion—namely, the production of an antitoxin or other antibody. It was a true vaccination. The hypothesis then supposed that the ethereal waves contributed to the process of auto-vaccination by the production of opsonins, by the detachment of the side chains of Ehrlich, by facilitating the reaction of toxin and antitoxin, or by setting free the vaccine from its laboratory in the glands. That was rendered the more probable when they reflected that the toxin and antitoxin carried opposite electrical charges, one flowing down and the other flowing up the electrical stream. Not only so, but they had recently had evidence that the micro-organisms themselves might be carried along an electrical current. All that gave rise to more than a presumption that the therapeutic effects both of electro-therapeutic and radio-therapeutic treatment might be due to the production or liberation of vaccines. One of the greatest arguments in favour of the vaccinal hypothesis was the latent period which followed Roentgen or radium irradiation, and which preceded the reaction. That ominous pause was, to his mind, eloquent, and indicated that all the resources of the organism were being called upon to resent the insult. The reaction was not merely a physical or chemical one, but a biological reaction, in which the energy of the recoil might exceed the energy of attack.

Dr. H. LEWIS JONES said that the fact that blood changes occurred after X ray exposures was well shown by the action of X rays in leukæmia, and experiments had also shown that leucocytes react to serum from an X-rayed animal in a way which differed from their response to normal serum.

Dr. W. PARRY MORGAN said that specific treatment had been tried only in recent years. They had the two principles of passive and active immunity. The former first held the field, but it certainly had not been satisfactory. The latter had been responsible for brilliant results in other diseases, and the few records of its application in pneumonia were those of success. However, it had had but an imperfect trial, and he submitted that his experience showed that, although they might expect failures, further trial was altogether justifiable. There was no doubt that lobar pneumonia might be caused by different strains of pneumococci; hence they could not expect one vaccine to be efficient in all cases, and the method must not be condemned, as it was by some people, because certain cases did not react when treated with stock preparations. In many other diseases the opsonic index had been the guide to the resistance and to the dose, but in pneumonia he had been unable to use it for that purpose. That had been given as an argument against the use of the index for determining doses. It was quite unjustifiable to quote his failure with the pneumococcus as a reason against the use of the index in infections where its value had been proved. He thought that with care and judgment pneumococcal vaccine could be used with the conviction that only good could result.

Mr. J. COURTENAY MACWATTERS said that in his hands vaccine therapy had yielded such uniformly good results that he had formed the opinion that, in cases of localised bacterial invasion treated by this method, cure was almost bound to result in almost every case, if one could succeed in three things—viz., the isolation of the offending organism, the preparation and administration in suitable doses of a vaccine made from it, and in promoting the flow of the resulting highly opsonised lymph through the infected tissues. Where failure had occurred, it had been his experience that the fault lay with the would-be immunisator, and not with the method.

Dr. W. D'ESTE EMERY said he had had both successes and failures in many branches of vaccine treatment, but he thought it only fair to say that many of the failures and some of the successes had been in patients in whom ordinary clinical methods had been given a full trial and had also failed. Most of his results were obtained whilst he made use of the opsonic control, and since he had abandoned the method his results had been neither better nor worse. The curative action of a vaccine was due mainly to its reactive action, and to a much less extent, if at all, to an elevation of the opsonic index. As a practical result of that he did not believe it to be necessary or even advantageous to control the injections by means of the opsonic index. In giving a vaccine he was desirous of causing a local reaction, and of thereby benefiting the patient, not of raising the opsonic index. The danger of the negative phase he believed to be a fictitious one.

Mr. F. ASHTON WARNER said that he found it was practically out of the question to make use of the opsonic index as a matter of routine owing to the necessary expense which the work entailed and the disinclination of patients to pay the fees, so that in the majority of cases he had to depend on the clinical signs as a guide to the amount and frequency of the doses. But in dealing with tuberculin in cases of infected cervical glands he made it a rule to rely on the opsonic index as a guide and not on the condition of the glands as judged by appearance and palpation. For it was impossible to judge of the condition of the deeper glands in the chest, and consequently the superficial ones did not afford a reliable guide. He had made use of vaccines by the mouth and hypodermically, and, so far as his experience went, most satisfactory results were to be obtained by either method. Patients certainly preferred oral administration to the hypodermic, and especially children, so that in their case at any rate it was of great advantage to be able to dose them by the mouth. Another advantage was that in cases of acne the dose of vaccine might be taken at intervals with only occasional visits to the medical man, the dose being regulated in accordance with the local reaction, which could be noted by the patient—a distinct advantage to the patient when the treatment was lengthy. The simplest way to give vaccines by the mouth was to direct the dose to be taken in a sherry wineglassful of milk the first thing in the morning, on an empty stomach. The milk must be first boiled. He thought that brilliant results were to be obtained from the timely use of vaccines, and that they might with advantage be given by the mouth. Whenever possible, the opsonic index was to be used, along with the temperature and clinical conditions, as a guide to dosage.

Dr. A. C. INMAN said that vaccine therapy was not, and never would be, an empirical form of treatment; it was based on scientific facts, and was essentially an individual treatment. Every case approached needed investigation. In the diagnosis of the case he would insist on supplementing the clinical methods with the direct and indirect evidence derived from laboratory tests. Then, as regards treatment, they had of necessity to consider the effect of the bacterial invasion on the body, and the attitude of the body towards the infection. To help them in that respect they had three guides, a consideration of (1) the general condition of the

patient, symptoms, and physical signs; (2) the temperature curve, for evidence of intoxication and activity of disease; and (3) the investigation of the serum as regards its content in protective substances—evidence of response or failure of response to the infection on the part of the infected organism. Each of these was valuable by itself, but the three together were much more valuable. All three must be considered individually and collectively; none must be ignored. As to whether vaccines could be administered by the mouth, he invariably preferred the hypodermic method to the oral, and, when possible, he always employed it. But, from a consideration of the clinical results obtained by the oral administration of vaccines, from a study of the blood changes and modifications in the temperature curve which ensue, he was convinced that vaccines could be satisfactorily absorbed from the stomach. The relationship between the opsonic curve and the temperature curve was a very important question. He had published a series of observations which showed that there was a very definite relationship between the two. He did not hold that the temperature could give the whole information as to dosage and spacing of vaccines, but he did think that it gave them a very good mirror of what was happening in the blood, and should in no case be neglected. Similarly, it would scarcely be upheld that the opsonic curve given was the whole story of the immunising response on the part of the body, but it gave very valuable information and, when practicable, should not be neglected. It was scarcely practicable to institute four-hourly indices on any number of cases, and so he believed that in these cases the imperfect guide of the temperature curve must suffice, with occasional reference to the opsonic index when necessary.

Mr. ALEXANDER FLEMING said that the basis of the acne pustule was a comedo which had for many years been associated with a bacillus which had been called the Bacillus acnes. That bacillus was very common on the skin of all seborrhœic individuals, and could be seen in myriads if a film of a comedo be made. While authorities were more or less agreed as to the micro-organism of the comedo, there was some difference of opinion as to the causation of the pustule. That seemed to him clear proof that the acne bacillus was responsible for the suppuration in some of the cases. Further proof was obtained by the results of administration of vaccines of the acne bacillus.

Dr. DAVID LAWSON (Banchory) said that experiments supported the claim made by Latham and his colleagues that tuberculin administered by the mouth in cases of tuberculosis was absorbed and modified the blood content. At Banchory they had gradually substituted for hypodermic medication the practice of administering tuberculin by the mouth. Only on rare occasions and for special reasons was the needle employed. So far as they could see, by this change of procedure one had not in any way sacrificed or diminished the benefit which in suitable cases the administration of tuberculin undoubtedly conferred. In pulmonary phthisis the tuberculo-opsonic index was quite valueless as a guide to prognosis. Whilst the chest signs, or constitutional symptoms, were still little more than suggestive, it was becoming more and more the practice of physicians to obtain a series of tuberculo-opsonic observations of such patient's blood at rest, and with those showing a range which varied outside of normal limits the physician inferred the presence of tuberculosis and at once advised serious treatment. Others preferred to employ exercise with a view of inducing auto-inoculation and then observing the effect of that auto-inoculation on the patient's tuberculo-opsonic index. If the index after moderate exercise showed a marked increase in the altitude when compared with that of the blood taken before exercise, then the presence of tuberculosis might be assumed. Of the two methods, the latter had, in their experience, proved the more reliable. So frequently had he been able in such cases sent for treatment afterwards to confirm with certainty the diagnosis arrived at by such means that he had come to attach a very high value to this use of opsonic methods in the diagnosis of phthisis. Contrary to the experience of some, he had never found the exhibition of tuberculin in cases of pulmonary phthisis accompanied by pyrexia followed by the reduction of the fever or activity of the disease. He had seen it in gland cases act in that way, but not where the lungs were known to be involved. On the contrary, he had in more than one instance had occasion to believe that the pyrexia was unfavourably influenced by the vaccine. As a matter of practical procedure he had now abandoned the practice of administering tuberculin in lung cases where fever is present. In treating early cases of phthisis from the commencement by a combination of tuberculin administration and sanatorium treatment, and watching recovery take place, it had been found difficult, if not impossible, to allocate to the action of tuberculin its just share in promoting recovery. The difficulty was increased when they recalled the fact that for several years before they were using T.R. as a routine procedure one saw a very large proportion of cases get quite well by sanatorium treatment alone. There remained a certain number, however, drawn from this class, and also from a class of more serious type, where the recovery advanced to a certain point and then all progress appeared to cease. Many of those cases ultimately went wrong. It was in that particular case that one now recognised how great a service might be rendered by the careful, systematic, and persevering use of tuberculin. They had heard the opinion quoted with approval by pathologists that the use of tuberculin or vaccines in pulmonary phthisis was practically valueless. The average pathologist's experience of the treatment of phthisis was drawn from two sources. First, from the ordinary advanced and usually hopeless case which was to be found in the wards of a general hospital; secondly, from private patients, for the most part old-standing chronic cases who had placed themselves in the hands of the pathologist for vaccine treatment. Many such had eventually come under notice who had previously undergone more or less prolonged courses of treatment at the hands of pathologists who had judged of their cases purely from information derived from systematic opsonic estimations, had never examined their chests, and who did not see their patients for weeks at a time.

Mr. LEONARD NOON said that abundant proof was forthcoming that the opsonic power of the serum was increased by inoculation of heated vaccines. Most of the toxins which could be obtained in workable quantities were destroyed by heat, so that their heated vaccines were, generally speaking, free of these toxins, and probably, therefore, did not give rise to antitoxin production in the body. The heated vaccine was not, however, to be condemned on that score, for the presence of a notable quantity of toxin would limit the dose which could be employed with safety. With such a vaccine the toxin would be the predominant factor in determining the dose, and we should, of necessity, aim at producing antitoxic immunity, whilst other forms of resistance would be lost sight of. But these latter were the more important, because they were directed to the removal of the infecting agent. It was therefore an advantage to use an atoxic vaccine in what is essentially an antibacterial treatment. The attempt to induce antitoxic and antibacterial immunity by one and the same inoculation seemed to him only likely to lead to confusion and failure.

BRIGHTON AND SUSSEX MEDICO-CHIRURGICAL SOCIETY.—The first meeting of the session of this society was held on Sept. 1st, Dr. F. Hinds of Worthing, the newly elected President, being in the chair.—Dr. E. Weatherhead showed a patient with an Abdominal Tumour whose history was as follows. He was a man aged 54 years, and had noticed the swelling about three months. There was pain in the epigastrium, especially after food, but no vomiting. He had lost flesh and had noticed that the lump increased in size. There was a mass visible in the right side of the epigastrium, which moved freely with respiration, and received a communicated impulse from the aorta. There was a considerable enlargement of glands above the left clavicle. The case was probably one of carcinoma of the pylorus, and was in too advanced a stage for operation.—Dr. Walter Broadbent showed a girl, aged 14 years, with almost complete ophthalmoplegia externa of the right eye, there being ptosis and no movement of the eye except very slight rotation by the superior oblique. This had come on suddenly three weeks before. The optic discs were normal. The girl had been under treatment for tuberculous disease of the tibia. She had also old ulceration of the palate, said to have been due to diphtheria, but more suggestive of syphilis. Probably the affection of the ophthalmic nerves was of this latter nature.—Dr. C. F. Bailey showed a boy, aged 12 years, who ten years ago had had a Tuberculous Abscess of the Neck. This had been opened,

and in the resulting scar keloid tissue had formed. This was removed four times, forming again after each operation. On the last occasion the keloid was very large and extensive. This was once more freely excised, and the wound left open, the boy being taken straight from the operation table to the X ray room, where a full Sabouraud dose was given over the open wound, which was allowed to granulate up. The result was a good sound scar without any sign of keloid. Later there developed slight keloid, but this has disappeared under repeated applications of X rays. The last operation was performed 18 months ago.—Dr. L. A. Parry read notes on two cases of External Anthrax. The first was in a Post-office servant who was engaged in cutting leather strips. He developed a malignant pustule on the neck, which was excised, but death ensued soon after. The second case was that of a young man who contracted anthrax on the wrist, which was freely excised within 24 hours. He made an uninterrupted recovery. The source of infection was uncertain. The treatment advocated was early and free excision. The prognosis was bad in those cases which were left untreated or in which the excision was left late.—Mr. G. Morgan read the notes of an unusual case of Gland Infection. The patient was a girl, aged 15 years, who complained of a sudden illness starting with chilliness and stiff neck. On examination there was found a large and tender gland in front of the sterno-mastoid on the left side. The throat was normal, but there were two loose carious stumps. The temperature was of an unusual kind, rising to 103° F., then dropping to normal for two or three days, then rising again to 103°. (The girl had not been out of England, so there was no suspicion of malaria.) There were several severe attacks of epistaxis during the course of the illness which were of obscure origin. The carious stumps were removed and the girl made a rapid recovery. In commenting on this case, Mr. Morgan pointed out that the special points of interest were as follows: first, the acuteness of the onset and the severity of the symptoms; secondly, the unusual type of the temperature; and thirdly, the alarming attacks of epistaxis. He also remarked that the lower gums were infinitely more potent than the upper gums and teeth in causing enlargement of glands and occasionally, of general sepsis. He was convinced that loose carious teeth were far more dangerous than fixed carious teeth. The reason why the glands draining the lower gums were so much more frequently affected was that they did not drain so well; also they were more exposed to strain and chill.—Mr. A. J. Martineau read a paper on a case of Frontal Sinus Disease. The patient was a woman, aged 60 years, who gave a history of two months' trouble on the right side of the nose and face. The symptoms were neuralgia, loss of smell, nasal obstruction, discharge, swelling of the face and orbit, and diplopia. On examination, the right side of the face was swollen and the right nostril was filled with a dark red friable polypoid mass. The hæmorrhage from the examination was so profuse that the mass was snared, scraped, and pulled out with forceps. The finger could then be passed into the cavity of the orbit and also into the antrum. The symptoms all pointed to a malignant growth, but a microscopical examination showed no signs of malignancy. Only three months have passed since the operation, and the subsequent history will be watched and reported to the society.

THE death is announced of Monsieur Gustav Moynier, president of the International Red Cross Committee, at the age of 84. He has presided at the meetings in Geneva since the foundation of the society in 1864.

THE FATHER OF THE ROYAL COLLEGE OF SURGEONS OF ENGLAND.—According to the *Standard*, the Royal College of Surgeons of England has received an intimation from Miss S. A. Steet, of South Hampstead, that her father, Mr. George Carrick Steet, who is the oldest Fellow of the College and is also London's oldest medical man, is enjoying fairly good health, though somewhat of an invalid. Mr. Steet is 92 years of age, and his memory and mental faculties are quite unimpaired. He became a Member of the College in 1840, and took the Fellowship in 1849. He was chief medical officer at the General Post Office for 20 years, and retired in 1891. He was also consulting medical officer to the Spanish Consulate in London.

Reviews and Notices of Books.

A System of Operative Surgery by Various Authors. Edited by F. F. BURGHARD, M.S. Lond., F.R.C.S. Eng., Teacher of Operative Surgery in King's College, London; Surgeon to King's College Hospital; Senior Surgeon to the Children's Hospital, Paddington Green. In four volumes. Vol. IV., pp. 687. London: Henry Frowde; Oxford University Press: Hodder and Stoughton. 1909. Price 36*s.* net per vol., or £6 net per set of four vols.

THIS is the last volume of this important System of Operative Surgery, and it deals mainly with those operations which may reasonably be considered to belong to special departments. It commences with Operations upon the Female Genital Organs, and these have been divided into the abdominal gynæcological operations dealt with by Mr. J. Bland-Sutton, and the vaginal gynæcological operations the account of which has been written by Dr. J. Phillips.

Mr. Bland-Sutton commences his chapter on abdominal section by some general directions for the preparation of the patient and of the materials used in the operation. It is certainly interesting to note the opinion expressed as to catgut as a suture material, especially in connexion with much present-day practice. The author says: "I regard it as an unsatisfactory and dangerous material"; and again: "The most dangerous and unreliable suture material for the abdominal incision is catgut." The second chapter deals with ovariotomy. Mr. Bland-Sutton never punctures a cyst before removal, even though it may require a very long incision to remove the cyst entirely. On this follow two chapters on hysterectomy and operations for extra-uterine gestation. The account of hysterectomy might, we think, reasonably have been more detailed. Operations during pregnancy and labour are next dealt with. A useful chapter is that devoted to the after-treatment, and to the risks and sequelæ of abdominal gynæcological operations. We are glad to see that attention is devoted to the great risks of injury to the ureter during the performance of these operations. We feel sure that it is an injury which occurs more frequently than many operators imagine.

Dr. Phillips's article on Vaginal Gynæcological Operations is very fully illustrated. He first deals with operations and injuries to the perineum and pelvic floor. Then follow descriptions of operations upon Bartholini's glands, of the methods of passing uterine sounds, of curettage of the uterus, and dilatation of the cervix, and lastly is described vaginal hysterectomy.

Mr. M. S. Mayou is responsible for the section on Ophthalmic Operations. He first treats of the preparations for operations on the eye, and describes the general considerations as to the making and healing of wounds in the globe. A very good account is given of the operations upon the lens; the descriptions are detailed, and the illustrations are numerous. The chapters on operations on the cornea require no comment. We think it would have been well if Mr. Mayou had explained a little more fully the reasons why in any individual case one operation should be chosen more than another, for he leaves the matter doubtful, as, for instance, in the question of the choice between simple enucleation, evisceration, Mules's operation and Frost's operation. The section on operations of the eyelid is good, but the account of the method of performing electrolysis is decidedly too brief to be of any value.

Operations on the Ear have been described by Dr. Hunter F. Tod. This section occupies more than 170 pages, and in

this fairly ample space he has succeeded in giving a very good account of this important and comparatively modern branch of surgery. The accounts of the methods of examining the ear and performing the minor operations on the external meatus are given very clearly and need no further mention. Naturally, the most important portion of this section is that which deals with operations on the mastoid process; the account is very satisfactory, and the illustrations are for the most part very informative. Students always experience much difficulty in understanding the anatomy of the middle ear, and therefore in the account of the operations it is always advisable for a description to be given of the anatomy. But while we are glad to see that Dr. Tod has included amongst his illustrations one intended to demonstrate the anatomy of the middle ear, unfortunately, the illustration is by no means as clear as it might be; we consider it would have been better if an illustration larger than life had been given. The very difficult subject of operations upon the labyrinth has been adequately dealt with. The considerations which should govern the mode of treatment of an infected lateral sinus are well described, and we thoroughly agree with the author that the jugular vein should be tied if the symptoms point to the onset of a general infection of the circulation from the infected sinus. The arguments against this treatment are devoid of foundation, and we may express our entire approval of the manner in which Dr. Tod has dealt with the whole subject. The chapter on operations for intracranial abscess of otitic origin is also very good.

Mr. W. Douglas Harmer is responsible for the section on Operations on the Larynx and Trachea. We find here a good account of the methods of operating by direct laryngoscopy. Mr. Harmer discusses very temperately the various operations which have been employed for the treatment of malignant disease of the larynx, and he claims that thyrotomy is the best operation for early malignant disease, whether carcinoma or sarcoma, so long as it remains intrinsic. He shows that the percentage of complete cures is high and compares favourably with almost any other operation for similar conditions in other parts of the body, and he claims the condition of the patient after thyrotomy is very satisfactory. We agree that the operation, though appreciated in this country, does not at present receive that recognition abroad which it deserves.

The last section of the book deals with Operations upon the Nose and its Accessory Cavities and has been written by Dr. StClair Thomson. Apart from the excellence with which the operations are described, the most noticeable feature of this section is the high standard of the illustrations provided. They serve to make clear the descriptions of the text. If we may select one portion of the article for special notice we should like to speak in high praise of the account of the methods of dealing with deviations of the septum of the nose. The story of the operations on the frontal sinus is also well told. Perhaps it might have been well to devote a little more space to the description of the operations for pharyngeal adenoids when it is borne in mind how extensively this operation is performed by those who have not devoted especial study to this branch of surgery. It is an operation which is often carried out inadequately and unsatisfactorily, and therefore we think that a fuller account might have been given. This is, however, a very small matter, and does not detract from the value of the section. There are five separate indexes, one for each section. We should have preferred an index to the whole work instead or as well.

In concluding our notice of the volumes of this System of Operative Surgery we may congratulate Mr. Burghard on the general high level which has been maintained.

Ophthalmic Surgery. By CHARLES H. BEARD, M.D. London: Rebman, Limited. 1910. Pp. 674. Price 22*s.* net.

THIS superficially attractive production is good, but it might be much better. Apart from the comprehensive but extremely tedious work in German by Czermak, there is no exhaustive treatise on operative ophthalmic surgery that enters into the elaborate discussion of details which is so useful and essential to the as yet inexperienced operator. Grimsdale and Brewerton's work describes most of the operations commonly employed, but conveniently as the methods are collected in comprehensive form, this manual lacks the exposition of minutiæ and the discrimination of precise indications for alternative procedure which are the preponderant requirements of the student in a work of this nature. Dr. Beard has succeeded in fulfilling these requirements to a very considerable extent, and we find little to quibble at in his methods and advice. These are the outcome of many years of experience and they will meet with general approval, though in these matters there is, of course, ample room for individual opinion, which will not always accord completely with the author's.

The literary style—if it is permissible so to degrade the term as to use it in this connexion at all—is appalling, even when judged by the standard of the average transatlantic scientific work. Expressions only to be described as slang of a peculiarly pungent type abound and detract from the dignity which should characterise the work, whilst adding nothing to lucidity of expression. Printer's errors, to use a hackneyed simile, are multitudinous as the leaves in Vallombrosa.

Having said thus much in detraction, we may turn our attention to some of the many merits of the book. It opens with introductory chapters on para-operative technic (*pace* our classical critics!) and instruments and their management. These matters are treated in considerable detail, stress being laid upon Landolt's canons of construction of instruments. The descriptions of operations follow in a series of chapters devoted to operations upon the appendages of the eye; upon the extrinsic muscles of the eye; upon the lids for ptosis, for entropion, and ectropion; upon the conjunctiva. The surgical treatment of trachoma; operations upon the globe; extraction of cataract; operations upon the orbit; and the methods for the removal of foreign bodies from the interior of the eye follow. In most cases the historical development of various operative procedures is passed lightly in review, sufficient information being conveyed to stimulate interest in the subject without overburdening the text. The author's predilections are stated judicially and the reasons given for the faith that is in him. His advancement operation, which may be regarded as a modification of Weber's single-suture operation, is a case in point. We are in full agreement with the opinion that a firm anchorage near the cornea is of prime importance in these operations. Iridectomy is discussed first in general terms, special indications in specific varieties following. Since the variations are so great—e.g., in iridectomy for optical purposes as compared with iridectomy for glaucoma—we think that a detailed description of each operation, though it might involve some repetition, would have been preferable. Extraction of cataract, with its attendant difficulties and accidents, is well discussed. Two pages of "don'ts" include many maxims of value; "don't get shaky" heads the list. In dealing with the "Indian" method of extraction of cataract in the capsule Dr. Beard voices the general opinion of judicious ophthalmologists in saying that "when the time arrives that the average operator can rid the eye at once of cataract, subcapsular cortex, and capsule with as little ultimate damage to the integrity of the organ as it now incurs from the best chosen of other methods, ophthalmic surgery will have made

an enormous step in advance. That such a time has not arrived no one can deny, and few, perhaps, are so optimistic as to believe that it is near."

Super-Organic Evolution: Nature and the Social Problem. By Dr. ENRIQUE LLURIA. With a Preface by Dr. D. SANTIAGO RAMON Y CAJAL. Translated by RACHEL CHALLICE and D. H. LAMBERT, B.A. Oxon. London: Williams and Norgate. Pp. xviii. + 233.

THE object of this book is to show that man will never free himself from his degeneracy so long as he lives in opposition to the harmony of universal laws; and in trying to find the key to the problem of how the fundamental principles of nature are infringed Dr. Lluria soon got on the track, for one day he said to himself, "The inheritance of humanity is nature, natural forces. Capital or *money* is but a limited resource, and it does not confer joy on man as a whole." His programme is divided into two parts, the first being to show how the social organism is in complete disaccord with the theory of evolution; the second, to prove how it is possible that a society organised according to these laws of evolution becomes susceptible of a rapid and indefinite development. Super-organic evolution is apparently the development of human society, the super-organic organism; and the results at which Dr. Lluria arrives are of a startling—indeed, of a revolutionary—nature. Dr. Lluria has evidently made a deep study of sociologists (Herbert Spencer, Haeckel), physiologists (Ramon y Cajal, Kölliker, and others), and physicists (Crookes, Mendeléeff, and others); he is a profound admirer of Darwin, though he holds his own ideas of "the struggle for life"; indeed, the number of authors quoted points to the assiduity of the writer, and the result of all this elaboration is a fantastic and Utopian dream of what the world will be when human nature has fully evolved, emancipated from the degrading influences which impede the correct working of its mechanism. The predicted paradise reads like a fairy tale. It is, indeed, difficult to travel with Dr. Lluria in his flights of imagination unless we are prepared, on returning to earth, to blot out all memory of things as we left them and to find that in the world of the future everything of a noxious nature will be eliminated—in his own words, "the family of the future will be love!" In order to realise the state of things held up in the chapter on the "medium" (universal mechanics), it is indispensable (says Dr. Lluria) for future communities to reconstruct their cities on sanitary principles, because cities and all their buildings are the result of an absurd social organisation. In a word, the whole of the present social medium is incompatible with the society of the future. Professor Ramon y Cajal seems to have been infected by Dr. Lluria's hedonism, for he says in his preface: "A time will come when the cosmos sets in motion an endless number of machines, and manufactures articles at ridiculous prices; when, having discovered the secret of chemical synthesis, the engineer of the future, without competing with the earth, elaborates the seed, gluten, albumen, sugar, and fat. What will it matter that love multiplies the species without end? There will be the human brain generously offering us new and saving inventions. The treasure of the inextinguishable solar ray will be able to produce shining fruits and golden ears." It is really rather difficult to believe that Ramon y Cajal is serious in his laudatory remarks, especially when he talks of "replacing the arbitrary hypotheses of Darwin and De Vries by the nerve theory of the inheritance of acquired qualities."

Among much that is obscure in phraseology, we fail to find proofs either that the proposed millennium is possible or probable; there is a somewhat confused mixture of facts and theories taken from different sources, but the conclusions drawn are little more than assertions, and we rise from a perusal of Dr. Lluria's book with a feeling of relief that geologic ages are likely to pass before the foretold cataclysm occurs. The translation of the book has been very readably performed.

Post-Mortem Manual: a Handbook of Morbid Anatomy and Post-Mortem Technique. By CHARLES R. BOX, M.D., B.S., B.Sc. Lond., F.R.C.P. Lond., F.R.C.S. Eng., Physician to Out-patients, St. Thomas's Hospital, &c. London: J. and A. Churchill. 1910. Pp. 335. Price 6*s.* net.

THIS little book is intended as a guide to students and practitioners in the performance of necropsies, and it is admirably adapted to this purpose. Beginning with a brief account of the instruments needed and with advice as to taking notes, it deals next with the external examination of the body and with the incision requisite to expose the viscera. The account then follows the steps of the usual routine method of making a necropsy. The opening of the chest is described and the morbid conditions likely to be found in so doing; and then each organ is considered in turn, the incisions for opening it are described, and the pathological conditions which may be found in it are enumerated. The same system is followed in the account of the abdomen and pelvis with their contents. The examination of the brain and spinal cord is next taken up and similarly treated, and is followed by a chapter on the morbid conditions that may affect the bones and joints. The scrutiny of the organs of special sense is dealt with in a separate chapter, very useful advice being given as to the methods to be pursued in this rather difficult stage of the proceedings. Finally, there are chapters on the special examination necessary in the case of newborn infants and on the mode of embalming a body.

We can hardly praise this little book too highly as excellently fulfilling the design of the author. We have indeed only one complaint to make, and that is in respect of its alternative title, "A Handbook of Morbid Anatomy." This it certainly is not, if the words imply, as we should suppose, a full and systematic description of the morbid conditions which may be found after death. These are enumerated, and rough descriptions of the general appearances are given in many cases, sufficient to put the reader on the look-out for them, and to assist him to some extent in distinguishing one from another; but this is much less than we should expect in a handbook of morbid anatomy. There are a few illustrations, chiefly showing the methods of incising the different organs. There is also a good index.

We heartily commend the book, which should find its way into all post-mortem departments.

Difficult Labour: a Guide to its Management. For Students and Practitioners. By G. ERNEST HERMAN, M.B. Lond., F.R.C.P. Lond., F.R.C.S. Eng. New and enlarged edition, with added chapters on Retroversion of the Gravid Uterus and Puerperal Eclampsia. With 180 illustrations. London: Cassell and Co., Limited. 1910. Pp. 547. Price 12*s.* 6*d.*

Dr. Herman's book on difficult labour is one of such excellence that we welcome the appearance of this new and enlarged fifth edition. The book has been revised throughout, a number of additions have been made to the letterpress, and further illustrations have been added. Accounts of eclampsia and retroversion of the gravid uterus have also been added, although these two complications of pregnancy do not really come within the scope of the work. The book preserves all the characteristics of the earlier editions. The author is nothing if not dogmatic, and while his position as an eminent specialist and teacher entitles him to be dogmatic, he hardly increases our respect for his authority when we find such a statement as "to expect to stop bleeding from

the uterus by applying a plug to the vagina is absurd." That it is possibly not a good way we admit, but to term a method of treatment absurd which at any rate is extensively taught at the present time by some of the most distinguished obstetricians in this country does not seem to us a very temperate or, indeed, useful statement. For an excellent account of what not to do and of the many fallacies that are ever present in the various methods of treating eclampsia we commend the reader to the chapter on that subject in this book. It is a matter of congratulation that Dr. Herman should have decided to add a chapter on retroversion of the gravid uterus and its incarceration. As he remarks truly, there is a vast amount of misconception about the usual results of such an accident, and upon these misconceptions a large amount of faulty treatment has been based.

The whole book is a credit to its author, and he does well, as he is a great admirer and a worthy disciple of the classical English writers on obstetrics, to remind us so often of the good work which has been done by them, with which many of the writers of modern text-books seem strangely unfamiliar. This fifth edition we can strongly recommend to all students and practitioners; it cannot fail to be of the utmost help to the former in their examinations and to the latter in their practice.

The Diseases of Children. By JAMES FREDERICK GOODHART, M.D., LL.D. Aberd., F.R.C.P. Lond., Consulting Physician to the Evelina Hospital for Sick Children; Consulting Physician to Guy's Hospital, &c. Ninth edition. Edited by GEORGE FREDERICK STILL, M.A., M.D., F.R.C.P. Lond., Professor of Diseases of Children, King's College, London; Physician for Diseases of Children, King's College Hospital; Physician to Out-patients, the Hospital for Sick Children, Great Ormond-street. London: J. and A. Churchill. 1910. Pp. 931. Price 15*s.* net.

THIS admirable manual of the diseases of children has reached its ninth edition and is therefore in no need of detailed review or even of commendation, since it has already taken a high place among standard works on the subject with which it deals. The present edition is the outcome of a thorough overhauling of the text by both authors, and it contains 100 pages more than the last. For the first time a few illustrations have been added. These are for the most part reproductions of photographs of characteristic examples of special diseased conditions, and they add to the value of the descriptions given in the text. The subject headings are also given in larger and thicker type than in previous editions, and the cover is of a deep red colour in place of the green of previous editions. In other respects the general character of the book remains the same, and it retains the personal note in much of the descriptive matter which gives it a special interest and value as a record of wide experience. In the preface Dr. Goodhart explains that Dr. Still must be understood to be the predominant partner when the plural "we" is used in the text, but that where possible he is made to speak in his own name, since a good deal of his own work in regard to special subjects is embodied in the book.

Every student commencing the study of the diseases of children would do well to read the introduction to this book, since it abounds in wise practical hints in regard to the methods of examining children. The important question of feeding is also dealt with in a thoroughly satisfactory manner, and the group of diet diseases, which form so large a proportion of the disorders of early life, are treated fully. The interesting conditions of recurrent vomiting and congenital hypertrophy of the pylorus are both considered at some length and their diagnosis is carefully discussed. The subject of infantile paralysis is also described in an interesting manner, and the results of recent work upon its nature and probable infective origin are incorporated. An interesting account of the pyelitis of infancy is given, illustrated by two temperature charts. In connexion with tuberculosis the value of the newer methods of diagnosis by means of tuberculin is briefly discussed.

In summing up our opinion of this book we may say that it has been brought up to date, and that it remains, as it has been throughout its previous editions, a valuable practical handbook for the student, and one which, after qualification, he will do well to retain on the shelves of his professional library.

LIBRARY TABLE.

The Housing, Town Planning, &c., Act, 1909 (9 Edw. VII. ch. 44), with Introduction, Full Explanatory Notes, and Index. By W. A. CASSON (of the South-Eastern Circuit) and ATHELSTAN RIDGWAY, LL.B. Lond., Barrister-at-Law. Second edition. London: Charles Knight and Co., Limited. Pp. 148. Prices, net, 15*s.* per doz.; single copies, paper, 2*s.*; cloth, 2*s.* 6*d.*—This volume, which has already found sufficient appreciation to warrant the issue of a second edition, is, as its title and range of prices indicate, designed as a handbook for the officials and members of local councils, to whom has been entrusted a very wide discretion in the carrying out of Mr. Burns's most valuable statute. It is well calculated to prove useful as such in many respects. Its introduction is clearly written, and its explanatory notes, anticipatory as in such circumstances the comments of the legal editor are compelled to be, are designed to serve as a warning with regard to difficulties likely to arise in practice and to assist in the elucidation of those due to the form in which the draughtsman has embodied the new law. We note with cordial assent a protest by the editors in their introduction against the objectionable system of legislating by cross-reference, which renders so many Acts of Parliament absolutely unintelligible to anyone not equipped with a library of statutes. Part I. of the Act dealt with is referred to as an extreme example of this, and a codifying measure is suggested. Mr. Casson and Mr. Ridgway are to be congratulated on the whole, but they do not appear to have realised the usefulness of an extra lucid and complete index for the guidance of persons not lawyers in handling a new subject. Looking at their index from the point of view of the medical officer of health anxious to ascertain his new duties, we do not find any reference to him under the letter M, although he figures unexpectedly under C as an officer employed by the County Council. Turning again to the important topic of rural housing, we note that the functions assigned to rural district councils do not appear under that title, but are scattered under headings suggested by the powers dealt with. We beg to recommend as a principle of indexing in works of this kind that all bodies and all individuals should be able to get readily upon the track of those provisions which most intimately affect themselves.

Errors of Refraction and Their Treatment. By CHARLES BLAIR, M.D. Durh., F.R.C.S. Eng. Second edition. Bristol: John Wright and Sons, Limited. 1910. Pp. 106. Price 2*s.* 6*d.* net.—The fact that this little book has reached a second edition shows that there is demand for such works. It comprises in somewhat elaborated form the details of errors of refraction and their treatment, such as are included in any manual of ophthalmology. Thus the estimation of visual acuity, emmetropia, accommodation, convergence, asthenopia, ametropia, hypermetropia, myopia, astigmatism, presbyopia, strabismus,

and anisometropia are treated in succession, and a few final remarks are made about the examination of patients and the constituent parts of spectacles. The work is in every respect sound and reliable, the teaching is in accordance with the principles inculcated in the best schools, and there is an absence of that lack of judgment and superfluity of exaggeration which so often mar brochures of this well-known type. We cannot avoid the impression that it caters for a class which demands a royal road to knowledge —and practice—whilst they are unable or unwilling to traverse the arduous and thorny path which alone leads to success; as against this feeling we must set the fact that in a workaday world everyone has not time to know all about everything. It is absolutely essential that practitioners should be familiar with simple ophthalmology, and this work will tell them much and form a good introduction to more.

JOURNALS AND MAGAZINES.

The Journal of Physiology. Edited by J. N. LANGLEY, Sc.D., F.R.S. Vol. XL., No. 6. August 15th, 1910. London: C. F. Clay, Cambridge University Press. Price 3*s.* 6*d.*—The contents of this number are: 1. The Question of Hæmolysis in the Liver, by Leonard Findlay, M.D. Glasg., of Glasgow. Dr. Findlay finds that the blood of the hepatic vein contains more red blood corpuscles per cubic millimetre than that of the portal vein, and in accordance with this more hæmoglobin. No trace of hæmoglobin was found in the serum. There is no evidence that hæmolysis takes place in the liver. 2. The Transformations in the Fats in the Hen's Egg during Development, by Elizabeth C. Eaves, from the Institute of Physiology, University College, London. Her experiments show that there is a loss of fat during development, the first step being the formation of double linkages. 3. Periodic Breathing at High Altitudes, by C. Gordon Douglas, B.M. Oxon., Fellow of St. John's College, Oxford. The altitudes at which his experiments were carried on were 300 feet, 7000 feet, and 10,700 feet The causative factor responsible for the periodicity of breathing observed is ultimately deficiency of oxygen. 4. The Determination of the Total Oxygen Capacity and Blood Volume at Different Altitudes by the Carbon Monoxide Method, by C. Gordon Douglas, B.M. Oxon. 5. The Action of Tetrahydropapaveroline Hydrochloride, by P. P. Laidlaw, M.A., B.C. Camb., from the Wellcome Physiological Research Laboratories. 10 milligrammes intravenously administered to a rabbit were followed by greatly accelerated action of the heart and a quicker rate of respiration. It greatly relaxes the muscular tissue of the uterus and reduces the tone of the bronchiolar muscle. 6. The Colour-blind Margin of the Blind Spot and the Scotometer, by John Berry Haycraft. The instrument used is described. Where the limits of the blind spot have been defined it is found that blue is the colour first recognised outside of that limit. The order in which the other colours are recognised varies in different cases. Red appears first grey, then yellow, then orange, and finally red. Green appears first grey, then yellow, and finally green. This number contains also the Proceedings of the Physiological Society for June 18th, 1910, and for July 9th, and the index and table of contents of Vol. XL.

Ophthalmology. Edited by H. V. WÜRDEMANN, M.D., and A. M. MACWHINNIE, M.D., Assistant Editor, with a large staff of subeditors. Published in England by George Keener and Co., 16, Red Lion-square, London; in the United States at 411, White Building, Seattle, Washington. Vol. VI., No. 4. July, 1910 Price 6*s.* 6*d.*—In addition to copious abstracts from English and continental journals and some reviews, this number contains 13 original articles. Amongst them is a suggestion by Dr. R. Denig for a mode of operation for chronic glaucoma applicable to such cases as do not yield to iridectomy. The operation consists in inserting a flap of conjunctiva removed after an iridectomy through the corneal wound and drawing it through the anterior chamber and through a perforation made in the cornea 2 millimetres from the corneal margin. It appears as though the conjunctiva would aid in forming a cystoid cicatrix, and will at all events maintain a permanent drainage that might prove of advantage in chronic cases of glaucoma. Dr. J. H. Claiborne, under the title of "Things that have Happened," gives an amusing account of some exceptional cases that have occurred in his practice. Dr. William Phillips discusses the treatment of a form of amblyopia named "argamblyopia," due to the restraining influence of congenital astigmatism. Dr. E. E. Blaauw gives a historical account of the treatment of diseases of the lacrymal apparatus, from which it appears that the oldest mention of the operation for lacrymal fistula occurs in the laws of Hammurabi, King of Babylon, 2250 B.C., in which the severe edict is promulgated that the physician who in opening a lacrymal tumour causes the loss of an eye shall have his hands cut off. Dr. F. H. Koyle gives the details of an interesting case in which considerable repair of the cornea followed after a burn. Several isolated cases are also recorded, and Dr. J. Hirschberg contributes an article on "A Plagiarised Text-book of Ophthalmology by Mr. William Rowley." This number also contains numerous abstracts from foreign journals, a table of contents, and an index to Vol. VI.

MELÆNA.—In reviewing a book by Mr. B. G. A. Moynihan on "Duodenal Ulcer" last week it was suggested that the word melæna was plural and not singular. Mr. Moynihan has written to us quoting "Copland's Dictionary," "Murray's New English Dictionary," and the "Century Dictionary," all of which agree that the word is the feminine singular, the word "nosos" being understood.

Reports and Analytical Records
FROM
THE LANCET LABORATORY.

GLASHAGEN MINERAL WATER.

(AGENCY: FEATHERSTONE AND GRAY, 9, FARRINGDON-AVENUE, LONDON, E.C.)

THIS interesting mineral water may be described as a natural soda water since its chief constituent is bicarbonate of soda, the salt occurring naturally in the spring at Glashagen, near Doberan in Mecklenburg. One advantage of the water is that it is not excessively mineralised, as, according to our analysis, the total mineral constituents amounted to 7·5 grammes per 10 litres. The water is practically free also from calcium salts. The following constituents were estimated, their amounts being given in grammes per 10 litres: sodium bicarbonate, 6·40; magnesium bicarbonate, 0·07; calcium bicarbonate, 0·64; sodium chloride, 2·0; silica, traces; and ammonium chloride, 0·0036. From this analysis the antacid properties of the water are evident. On examination for organic matters there were some indications of the presence of vegetable products, but there was no suggestion whatever of any animal-derived matters. The water is singularly fresh and clean to the palate and is pleasantly charged with carbonic acid gas. It is practically free from iron and sulphates and therefore mixes perfectly with wines and other alcoholic beverages. Further analysis elicited the presence in traces only of potassium and of bromine. The water clearly belongs to the class of alkaline

saline waters which are oftentimes prescribed with advantage in gastric catarrh and in chronic catarrh also of the urinary organs.

CELLASIN.

(MEAD, JOHNSON, AND CO., JERSEY CITY, N.J. AGENCY: MAY, ROBERTS, AND CO., CLERKENWELL, LONDON, E.C.)

Cellasin is a remarkable product if the claims made in its favour can be substantiated, and evidence obtained in our own laboratory is on the whole unopposed to these claims. We had no difficulty, for example, in demonstrating the disintegrating action of cellasin on both starch and sugar. It resolves sugar into lactic acid, and consequently starch may be transformed into the same product. On keeping a solution of cane sugar to which a little bicarbonate of soda had been added with a small quantity of cellasin at 100° F., the development of lactic acid was soon evident, and after 24 hours the liquid gave definite reactions for lactic acid. It is claimed that since this action proceeds in the presence of an antiseptic the change is due to an enzyme and not to bacteria. In a similar experiment cellasin was found to convert 17 times its weight of starch in two hours at the same temperature. Cellasin, again, has the property of emulsifying and resolving fats in alkaline media. It may be observed that cellasin is unaffected by acid fluids of the strength of the gastric juice. It passes through the stomach, therefore, with its activity unaffected, to be then available in the alkaline conditions further along the alimentary tract. Cellasin is soluble in water rendered alkaline by sodium bicarbonate, but is only slightly soluble in a neutral or acid fluid. It is stated to be a ferment prepared from the cultivation of fungi, the enzymes being expressed free from cell attachment by suitable means, and for administration in malnutrition is prepared in tablet form. It is mentioned favourably in connexion with tuberculosis and other wasting diseases.

VALIER CHEESE.

(W. H. ROBSON, PURTON, WILTS.)

We are quite prepared to accept the statement that this cheese is made from pure new milk into which a fine culture of lactic acid bacilli has been introduced. On placing at all events a small crushed sample of the cheese in milk and incubating at 100° F. the acidity of the milk developed until in 24 hours it had quadrupled over the initial quantity of acid present. Apart from that fact the cheese has an excellent flavour, recalling the elegance of fine old English cheese. The condition of the cheese was sound; its flavour was smooth and free from any suggestion of "bite"; we found it easily digestible, a quality which is not surprising, seeing that scientific care is given to its preparation.

VEGETABLE CHARCOAL PREPARATIONS.

(J. L. BRAGG, LIMITED, 14, WIGMORE-STREET, CAVENDISH-SQUARE, LONDON, W.)

The very singular adsorptive and absorptive properties of well-prepared charcoal suggest its therapeutic value. The quality of the charcoal, however, must be unimpeachable, and it requires preparing with care in a special way. We have examined charcoal which appeared to be quite inactive and therefore of no use for therapeutic purposes. In a series of experiments made with Messrs. Bragg's preparations the evidence was very clear as to their adsorptive and absorptive properties at any rate *in vitro*, and there is no reason to think that they would not similarly be effective *in vivo*. Bragg's charcoal, for instance, absorbed ammonia and absorbed also and deodorised sulphuretted hydrogen in solution in water. It further removes the tannin from tea, and many of the poisonous alkaloids are absorbed by charcoal. The application of this property to the removal of gas or acrid products of indigestion is thus obviously indicated, and in many cases the use of charcoal in some forms of flatulent dyspepsia has been attended with satisfactory results. Its action may continue in the bowel and there possibly control flatulent conditions. Charcoal is evacuated from the body unchanged. We examined two charcoal powders, one being more finely powdered than the other, and in the one case the mineral matter amounted to 6·67 per cent. and in the other to 4·19 per cent. This contained calcium carbonate and a relatively small amount of phosphate. Animal charcoal, of course, gives a large residue of phosphates. The preparations included charcoal in capsules (in an oily vehicle) and charcoal also in an agreeably tasting chocolate envelope.

DIGESTIN.

(AGENCY: BURGOYNE, BURBIDGES, AND CO., 12 AND 16, COLEMAN-STREET, LONDON, E.C.)

Digestin is described as a digestive ferment procured from the okazaki fungus, which belongs to the aspergillus family, and is prepared in the pharmaceutical laboratory at Somei Sugamo, Tokyo, Japan. On examination it proved to be a fine yellowish powder practically soluble in water. Experiments showed that it had a remarkably powerful action on starch, reducing starch paste almost instantly into a limpid fluid and converting it finally into sugar. A quantitative experiment showed that digestin was capable of transforming no less than 100 times its weight of starch into sugar in an hour kept at body temperature. We were not so successful, however, in the experiments in which we placed digestin in contact with finely powdered beef freed from fat. There did not appear to be any marked digestive action upon protein either in weak alkaline or acid fluid. It is stated, however, that digestin will liquefy into assimilable form 100 times its weight of milk, converting it almost into peptone, and that also it will liquefy animal fibrin to the extent of 100 times its own bulk and vegetable fibrin 10 times the amount in about two hours. Digestin is recommended in cases where the nutritive processes need assistance, as in wasting diseases.

PURE CHINA TEAS AND BLENDS.

(THE MAZAWATTEE TEA COMPANY, LIMITED, TOWER-HILL, LONDON, E.C.)

We have examined these teas and the results are quite in accordance with the description given of them. Two specimens consisted of pure China tea and two of China teas blended with other teas. Infusions made with these teas proved satisfactory to the palate and free from roughness. China teas in our experience can be distinguished by chemical tests from Ceylon and Indian teas, and such tests applied to these teas readily differentiated them. Those persons who are careful as to the quality of the tea they drink may use these teas and blends with confidence.

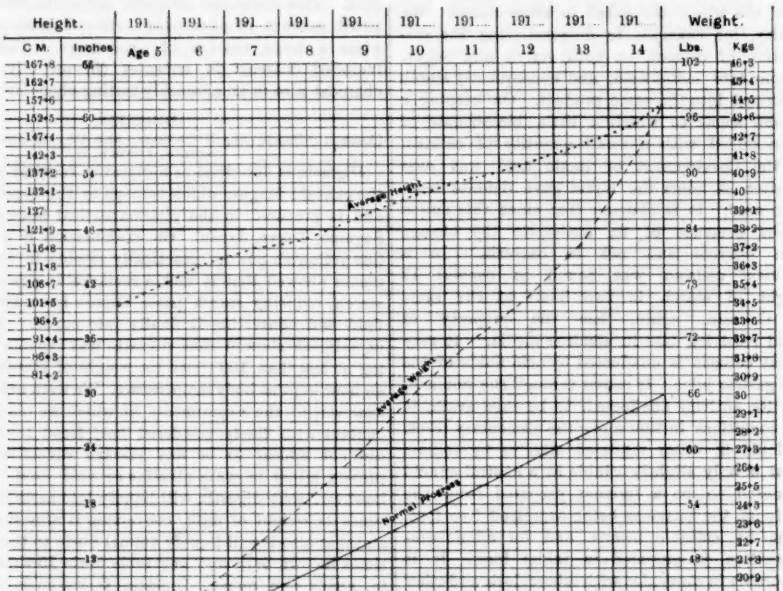
BOLINGBROKE HOSPITAL.—At an extraordinary general meeting held recently the governors of Bolingbroke Hospital, Wandsworth Common, resolved to repay the £5000 which the trustees of the late Mr. Benjamin Weir in 1907 advanced to the hospital, under the authority of the Charity Commissioners. It may be remembered that opposition to the action of the Charity Commissioners recently arose on account of the allocation to the Bolingbroke Hospital of funds bequeathed by Mr. Weir for the benefit of Streatham medical charities.

COLONIAL MEDICAL SERVICES.—*West African Medical Staff:* Dr. A. E. Horn has been selected for temporary special service in the Colonial Office. Dr. F. Ross has been selected for an appointment in Southern Nigeria. *Other Colonies and Protectorates:* Dr. J. W. Eakin, district medical officer, Trinidad, has been transferred from Port of Spain South to Port of Spain East. Dr. C. L. Eyles has been appointed Assistant Colonial Surgeon in British Honduras. Mr. F. A. de Verteuil, district medical officer, Arima, Trinidad, has been appointed District Medical Officer, Port of Spain West; and Dr. H. S. Sugars has been selected for appointment as a medical officer in the Straits Settlements.

New Inventions.

THE A. L. GRAPH MEDICAL CARD.

Mr. Fred. Smith, Halifax, sends us copies of medical chart cards, which he has drawn out for the use of school medical officers at their inspection of school children. The cards have been adopted by the school medical officer and are in use in the borough of Halifax. The illustration is of the graph, and needs no explanation. Average values are taken from the figures of the Anthropometric Society (Proceedings of the British Association, 1883). In addition to the graph the cards have spaces for noting causes of irregularity of attendance, nature of clothing and footgear, state of hearing, speech, mentality and vision, and on the reverse of the card epaces for age, standard or class, cleanliness and condition of body and head, and the results of detailed physical examination. Cards for girls are coloured green and for boys white. The "normal progress" line has reference to the advance in class or standard, and allows of a rise of three squares per class per year. The card is published by J. Arnold and Sons, Limited, Leeds.



Looking Back.

FROM

THE LANCET, *SATURDAY*, Sept. 15th, 1832.

HYDROSTATIC BED

FOR

PATIENTS AND INVALIDS.

(Abridged from the 5th Edition of Dr. Arnott's "Elements of Physics," now in the Press.)

It is to mitigate all, and entirely to prevent some, of the evils attendant on the necessity of remaining in a reclining posture, that the hydrostatic bed described in the following account is intended. It was first used in the case of a lady, who, after her confinement, passed through a combination of low fever, jaundice, and slight phlegmasia dolens of one leg. She rested too long in one posture, and the parts of the body on which she had rested all suffered: a slough formed on the sacrum; another on the heel; and in the left hip inflammation began, which terminated in abscess. These evils occurred while she was using means to invigorate the circulation, and while her case was watched with affectionate assiduity. She was placed upon the bed contrived for invalids by Mr. Earle, with pillows of down and air, and out of the mattress of which portions were cut opposite to the sloughing parts. In spite, however, of all endeavours, the mischief advanced, the chief slough enlarged, another slough and a new abscess were produced, and her life was in imminent danger.

Under these circumstances, the idea of the hydrostatic bed occurred to me. Even the pressure of an air pillow had killed her flesh, and it was evident that persons in such a condition could not be saved unless they could be supported without sensible inequality of pressure. I then reflected, that the support of water to a floating body is so uniformly diffused, that every thousandth of an inch of the inferior surface has, as it were, its own separate liquid pillar, and no one part bears the load of its neighbour, and that the patient might be laid upon the surface of a bath over which a large sheet of the water-proof India-rubber cloth was previously thrown, she being rendered sufficiently buoyant by a soft mattress placed beneath her. Such a bed was immediately made. A long trough, a foot deep, was lined with metal, to make it water-tight; it was about half filled with water, and over it was thrown a sheet of the India-rubber cloth. Of this sheet the edges (touched with varnish to prevent the water creeping round by capillary attraction) were afterwards secured in a water-tight manner all round to the top of the trough, the only entrance left being through an opening at one corner, which could be perfectly closed. Upon this dry sheet a suitable mattress was laid, constituting a bed ready to receive its pillow and bedclothes, and not distinguishable from a common bed but by its surpassing softness. The patient was laid upon it; she was instantly relieved; sweet sleep came to her; she awoke refreshed; she passed the next night much better than usual; and on the following day all the sores had assumed a healthy appearance; the healing from that time went on rapidly, and no new sloughs were formed. The down pillows were needed no more.

THE LANCET.

LONDON: SATURDAY, SEPTEMBER 17, 1910.

Public Health Administration in British South Africa.

Now that the unification of British South Africa has become an accomplished fact, progress along the various lines of material development natural to a young and vigorous nationality may confidently be anticipated. But we must not be surprised if progress seems sometimes to halt. The vast country has been peaceful for some eight years past, but it must not be forgotten that for nearly three years previously all civilisation was at a standstill; while in the period that has intervened since there has been too much turmoil and unrest, social, political, and economic, to allow of the gradual and steady evolution that alone can be of permanent value. But the time has arrived for definite and substantial advances in the amenities of life, and it is this fact which suggests to us the need for considering the position of sanitary administration in British South Africa; for if there is one thing more certain than another in the development of States it is that the future will lie in the hands of the population which knows best how to control and maintain its public health. As the opening of the first Union Parliament by H.R.H. the Duke of CONNAUGHT will furnish a landmark in the constitutional history of British South Africa, so the assembling of the South African Medical Congress under the same Royal auspices will be a fresh starting-point in its public health history. It is not to be supposed that the members of the medical profession are the only body of men competent to lay down the lines of this advance and to carry it out: two other professions, the engineering and the legal, must give their assistance. But the foundations on which real progress in public health must be established consist in a sound knowledge of physiology, pathology, and the prevention of disease: which matters are primarily the business of the medical profession. The advances that have hitherto been made have been brought about primarily at the instigation and through the efforts of medical men trained in, and conversant with, the methods of sanitary science; and often, strange as it may appear, in opposition to the opinions of statesmen and men of affairs in other respects of the highest attainments and capacity. It is necessary, therefore, that the leaders of our profession should possess, in addition to professional skill and expert knowledge, a considerable amount of influence with the community such as can only, in ordinary circumstances, be assumed by official position. And here it is that we regret to find the present position in South Africa to be far from satisfactory.

By the Act of Union, which came into force on May 30th last, the whole of the general administration of the former colonies—Cape Colony, Natal, Orange River Colony, and Transvaal—which are now termed provinces, has been concentrated under the Union Government, a few purely local affairs only being dealt with by the provincial authorities. As with other departments of civil government, the department of public health is placed directly under the central authority at Pretoria. The duties with which this department is concerned include the control of epidemic disease and the prevalence of syphilis, port health administration, the care of lunatic asylums, lepers and leper asylums, the maintenance and control of local authorities in carrying out their public health duties, the direct care of the public health where no local health authority exists, the collection and tabulation of births, deaths, and vital statistics, the organisation of medical research, and the management of all matters relating to the medical profession and the practice of medicine, including in this the allied callings of dentists, chemists, midwives, and nurses. Cape Colony is the only province that has had a public health department for any considerable time. There, under Dr. A. J. GREGORY, has been evolved an effective health administration, the value of which was so well recognised that it had been constituted a regular Government department, to which have since been referred other matters appertaining to local government. The medical officer of health of the colony was the head of the department, with rank and status as such in the Civil Service. After the war public health administrations were organised in the other colonies, that in the Transvaal having powers similar to, but not so extensive as, those possessed in Cape Colony, and here Dr. GEORGE TURNER was appointed the first head. When responsible government was instituted in 1907 the new Colonial Secretary practically abolished this department, and a medical officer of health was appointed with apparently little or no powers of administration or control, his duties being merely advisory. Natal has a public health department definitely established, with the health officer of the colony at its head under the Colonial Secretary; there is also a Board of Health having advisory functions. Orange River Province has a public health department under the medical officer of health, subordinate to, and comprised within, the department of the Colonial Secretary. There is, therefore, no uniform system in existence, although there is excellent precedent in the country itself for the maintenance of an effective public health administration which would place the sanitary needs of the populace before any purely political exigencies or sentiments. The medical profession in British South Africa have recognised the importance of establishing public health administration on a sound basis under the Union, the effects of the retrograde movement in the Transvaal having become manifest. No one has voiced this feeling more clearly than Sir KENDAL FRANKS, the well-known Dublin surgeon, who now practises in Johannesburg. Sir KENDAL FRANKS has delivered addresses to the medical profession at Cape Town and other centres, pointing out the unsatisfactory position occupied by medical men in a political aspect. He mentions that on the general committee of the Johannesburg Hospital the medical staff were represented by three advisory members, *without votes;* that a commission of inquiry into the management of the hospital was

appointed (composed almost exclusively, strange to say, of the members of the management committee themselves), who recommended "that the honorary medical staff be not represented on the existing hospital committee or on any future hospital committee in any capacity"; and still more extraordinary, that although a Transvaal Medical Council was appointed by statute in order to administer the Medical Act, about a year later a Bill amending the Medical Act was brought in, without any intimation of the fact to the Medical Council, and when they protested against some of the clauses their protest was ignored and the clauses were passed. Unfortunately, it is not only in the Transvaal Province that the intention of depriving the medical profession of its legitimate position in the State has been manifested. Before the union took place, and while details of administration were being discussed in various centres, the virtual abolition of the Transvaal Public Health Department was fully considered by various branches of the British Medical Association and other medical associations in South Africa; definite resolutions were passed and forwarded to the Government asking that in the new Union Government a portfolio of Public Health should be established, either by itself or in conjunction with some other portfolio, to be held by a Minister of the Government. In spite of this, and with complete disregard of the very successful medical administrative experiences in Cape Colony, when the Union Government was established last June the administration of public health was allocated to the Department of the Interior, along with "all matters in relation to the public service, immigration, registration and control of Asiatics, statistics and census, elections and preparation of voters' rolls, Government printing and stationery, asylums, libraries, museums and observatories, naturalisation and passports, archives, arms and ammunition, and all such matters as are not assigned to any other department." The Minister to whom is committed this extensive charge, General SMUTS, is also responsible for the department of Mines and the department of Defence. Failure to appreciate the real importance of preserving the health of the community could hardly be more complete.

That the medical profession, as a whole, in South Africa does not obtain from the general community the consideration which is its due we must acknowledge, with Sir KENDAL FRANKS; that in official circles it has received a set back in the treatment that has been accorded to Dr. GREGORY at the Cape and Dr. TURNER in the Transvaal it is also impossible to deny. We are convinced, and we believe every impartial inquirer into the facts will allow, that the official course of action which has been taken is, all personalities apart, unwise in the true interests of these provinces and of the Union as a whole. As regards the want of courtesy and consideration to the medical profession, of which Sir KENDAL FRANKS gives instances, such things are not unknown in older and more settled communities. Our brethren in South Africa may feel assured that they have our sympathy, if only because in this country, too, the medical man suffers from official ignorance and neglect. We trust that many British medical men will visit Cape Town for the South African Medical Congress which is fixed for an early date in November, probably the 3rd. The voyage takes 17 days, and can usually be taken without experiencing much rough weather. The climate is most agreeable and exhilarating. For those who are lucky enough to be able to escape from our winter fogs and slush no more pleasant or varied holiday could be desired. The Union festivities at Cape Town, the grand scenery of the Victoria Falls, the battlefields, the mines, the near view of the development of the new South Africa, will all be of great interest to the visitor, and we are assured that a warm welcome would be extended by our professional brethren in the Union to visitors from home. We also feel that this would be an occasion for showing sympathy and support that would be highly valued by our colonial friends in present circumstances, and we trust that there will be much interchange of counsel and courtesies between the practitioners of the Old Country and the new Union.

The Aftermath of the Holiday.

IT is within the experience of a very large proportion of those who take holidays—and nowadays holidays are taken by nearly everyone as a matter of routine—that when the holidays are over the holiday-maker feels none of that exhilaration, none of that increase of energy, which he expected, and, indeed, had a right to look for, as the outcome of his freedom from work. In place of these pleasant sensations he feels exhausted, disinclined for exertion, and lacking in energy; in fact, very much as he felt before his holiday began. In some cases the change is definitely for the worse; the subject feels less apt for work, less capable of undertaking any exertion, mental or bodily—in a comprehensive and popular word, he is less "fit" than he was before he broke off work. Such a result is frequently seen—so frequently that it cannot be regarded as a casual occurrence, but rather as a natural result that might have been predicted from the conditions under which the holiday is often taken. That holidays are needed none will gainsay, and yet they are a comparatively modern idea. Many of our ancestors went from one year's end to another without any break in the course of their duties; in professional circles, outside the bar, vacations were unrecognised; while the commercial man who absented himself from his counting-house on the plea of obtaining a change of air would have been considered mad. May we adduce in support of this the evidence of JOHN GILPIN'S wife, who complained—

> "Though wedded we have been
> These twice ten tedious years, yet we
> No holiday have seen"?

In spite, however, of the custom of our predecessors it will be generally acknowledged that holidays are needed at the present time, and from this it must be concluded that we live more strenuous lives than those who went before us, while remembering also that we demand much more to make us happy. It is the pathetic side of elaborated civilisation that while we can get more we perpetually want so much more. Modern life is carried on at a tension unknown a century or two ago, while travelling facilities enable us at reasonable expense to visit all parts of the world which an abundant literature has already introduced to our knowledge. We need more holidays than men needed in the past because our lives are fuller and because opportunity has

bred the want, but it must not be forgotten that once upon a time—a time when the day's work was leisurely—Saints' days were very numerous, and formed a series of pleasant breaks in the working routine. It may be laid down as certain that holidays are needed now for those who live by their work; and many idle people slave so strenuously at being idle that they too want surcease from their exertions.

We may take it, then, as proved that there is a real necessity for rest among all classes whose labour, when they are at work, is not of an intermittent sort. Why, then, do so many holiday-makers fail to derive that benefit from their holidays which they might reasonably expect? The answer is obvious, though the circumstances which it implies are always easily to be avoided. The holiday, as only too often taken nowadays, is not a rest at all. The man who has been chained to a desk for 11 months of the year, and who has taken no more exercise than suffices to carry him to his office day by day, suddenly commences a violent outdoor existence; he walks or boats, or cycles for many hours every day; or he travels by train immense distances, remaining cramped in a crowded and ill-ventilated railway carriage for long spells at a time. He climbs mountains who has for the rest of the year had no more practice in climbing than is implied in negotiating the stairs of his house or the steps of his railway station. When a man makes such a sudden change in his life and exerts himself so intensely and with so little interval for the transition, can there be any room for surprise that this mode of holiday-making does not send him back refreshed? We would not for a moment suggest that exercise, even violent exercise, is in itself harmful at times for a sedentary man. It has been well said that the best rest is change of occupation, and this opinion we endorse fully. Therefore, he does well who, having been accustomed to little exertion during the working months of his year, spends his holiday in outdoor exercise, but he only too often misses the essential point. All change should be gradual. The body must have time to adapt itself to the changed conditions. A few days will not be misspent if they are devoted to a gradual increase in the amount of exertion undergone. Day by day the amount of exercise may increase in quantity, until it may become really great, and if this precaution be taken the result will be far superior to that which would have followed if no preparation had been made, and not only will the sensation of well-being be more clearly marked, but the physical exertion which can be accomplished will be markedly greater. The first essential to a holiday that is to do lasting good is that the change from the sedentary life to one of energetic outdoor exercise shall be made gradually. But this precaution is really only half of the matter. It is equally important that the return to the sedentary life should be gradual also, and then the reaction which so often results from a holiday will not occur. It will be noted that we are not discussing the risks of sudden and serious collapse from over-exertion, but only accounting for the disappointing feeling of fatigue that too often closes the holiday season of the busy man. Of course, the sudden undertaking of violent exercise is not without possible harm on the physical side. Tissues which have been unaccustomed to great strain are ill-adapted to endure it, and in no small number of cases permanent harm may follow. The heart of a man who has done no climbing for many months or even years is very liable to be strained unduly by even one great climb. All forms of physical exercise may produce a similar strain, but it is probable that no other form of exercise produces it so promptly as mountain climbing.

It may seem odd that we should think it necessary to point out such obvious things to our readers, but it is a fact that medical men are sadly deficient themselves in the prudence that they would inculcate in others. Nor is a holiday only unrestful and unprofitable where the physical exertion has been excessive. All excess is mischievous, and the man who gives himself too much to think about while he is away will not be truly making a holiday. A common fault and one productive of much after-fatigue is to go too far. Nowadays the passion to go as far as possible from home is so widespread that it is of little use to speak against it, and the facilities of travel are so great that it is useless to imagine that people will not take advantage of them. But long journeys must be taken with discretion. Protracted sitting in railway carriages is actively mischievous in many conditions, and especially is it harmful to let a long and wearisome journey immediately precede the return to work. The natural tendency is to utilise every possible moment for the holiday, and to such an extent is this carried that often the arrival home is timed for the morning of recommencement of work. Far better is it to allow a day or two at home before work begins again. Long journeys, moreover, generally mean great expense, and we are certain that anxiety as to money actively interferes with the advantages of many holidays. The man who is tormented with the necessity for strict economy while he has placed himself in an environment where that economy cannot be practised, and where a certain mild recklessness of daily expenditure will alone make life tolerable, is not extracting value from leaving off work—he is only exchanging one set of worries for another. Full physical value can only be obtained out of a holiday by a hardworking man if he graduates his bodily labours, working up to his maximum and working down from it before his return; full mental value will be greatly advanced by relief from money troubles. This last is a point that medical men do not always consider in their recommendations to their patients.

Medical Examinations under the Workmen's Compensation Act.

AT the Westminster County Court not long ago considerable discussion took place as to the alleged cause of the refusal of a workman in receipt of compensation under the Workmen's Compensation Act, 1906, to submit himself to medical examination when requested to do so by his employers. The refusal apparently had not been absolute, strictly speaking, but had been caused by the unwillingness of the workman to be examined by the particular medical practitioner whom his employers had designated for the purpose, and in his refusal he was supported by his

solicitors, who made it a condition that any examination by the gentleman named should take place in their office and in the presence of a member of their firm. At the conclusion of the argument which took place upon this occasion the county court judge held that the workman had refused to fulfil the condition imposed by the Act, and granted the employers' application based upon that refusal, but with regard to the result of the case referred to we do not now concern ourselves. The question whether a medical examination can take place in the presence of a layman in the circumstances indicated without its effectiveness being impaired is one of considerable importance. If it were possible that it should so be made without the truth being obscured, even though the medical man might be impeded to some extent and might personally prefer to be alone with his patient, there would be reasons to commend the innovation, and possibly a certain weight of public opinion in its favour.

In the instance which we have mentioned, and which we may take as being typical of what may happen at any time in county court districts far from Westminster, the medical man who was to examine the workman on the employers' behalf was Dr. R. J. COLLIE, who is a Doctor of Medicine and justice of the peace, holding the appointment of medical examiner to the London County Council and the Metropolitan Water Board, and of Home Office medical referee. In these official capacities Dr. COLLIE has had very considerable experience of the physical circumstances in which working men claim payment from their employers under the most recent Workmen's Compensation Act, and at the same time a large number of workmen have made the acquaintance of Dr. COLLIE. That gentleman fills posts which correspond with similar ones in other industrial centres and so cannot be said to occupy a unique position, and he has never, as far as we are aware, expressed any opinion upon workmen's compensation and its claimants which could be stigmatised as eccentric or peculiar. Like many others, however, who hold offices parallel to his own, he has become aware, as the result of his experience, that workmen having had placed before them by Act of Parliament the temptation to exaggerate their accidental injuries and to deceive medical men as to their incapacity for work, frequently yield to that temptation and become "malingerers." Like others also, and again guided by experience, he has found that with a view of ascertaining the truth, and in order that compensation may not be awarded to persons who are in greater or less degree ingenious impostors, the medical man who tests their claims on behalf of the employer has to exercise his observation and to pit his own ingenuity against theirs in a manner which must always be distasteful to him but which is essential to the performance of his duty. He has, for example, to ask questions the full import of which will not be understood at the moment by the person replying, or to suggest rather than to command physical movements the painless execution of which in an unguarded moment will "give away" the malingerer. Dr. COLLIE has had considerable success in detecting cases in which the workman has enjoyed or sought to obtain compensation to which he was not entitled, and not long ago he embodied some of his experiences in a paper read before the Stratford branch of the British Medical Association. On this occasion he made many useful and practical suggestions to medical men doing work similar to his own, and he opened his observations by defining the first duty of a medical man, when called upon to examine in a case of claim for compensation for injury, as being "to assure himself on the question of imposture." This may perhaps be regarded as a somewhat infelicitous manner of commencing an essay which may some day be laid before the writer in the witness-box as material for cross-examination, but the perusal of the context will satisfy the reader that the precaution suggested was amply justified by the facts at the author's command, and that the ascertainment of the truth was the only object which he had in view in making his recommendations. At the hearing, however, of the application to which we have referred a "dead-set," to use a popular phrase, was made against Dr. COLLIE. He was accused of unfair methods, of hectoring, and of browbeating the unfortunate man delivered over to his mercies in his own consulting-room, and the presence of the workman's solicitor was put forward as the only condition which could be reasonably relied upon to ensure fair play. There was, we need hardly say, no admission on the part of Dr. COLLIE that any of the statements made were true, and no credence will be given to them.

We have referred to the above case as being typical of others which may occur at any time in other parts of the country because we have no reason to believe that either the success or the zeal of Dr. COLLIE in seeking to protect the just interests of employers is peculiar to himself, and because we are further inclined to consider that the incidental rather than essential feature of the discussion to which we have last alluded is one of some importance in determining what the attitude of the medical profession should be towards any proposal to introduce any third person as a matter of legal right into the consulting-room in which the injured workman is examined. It seems to us that the mere fact that antagonistic interests are involved and that flat contradictions of fact may arise in the sworn testimony of two persons suggests that if it were possible without preventing the efficacy of the examination it would be advantageous to the cause of justice that a third person should be present, and that that person should occupy a position of quasi-judicial independence; but at the same time be capable of understanding the proceedings. No objection should, we think, be raised to the injured workman's medical adviser being present, but the presence of a solicitor representing the examinee seems to us repugnant to the object of the examination—which is to elicit the truth. It would be impossible to prevent interruptions, and perhaps wrangling, which would render the proceedings farcical, and, again, where dispute afterwards took place as to the facts of the examination there would be two witnesses to one. The solicitor would be quite capable of understanding much which escaped the notice of his client and a warning cough would often be sufficient. It may therefore be

suggested that whenever the workman anticipates treatment unfairly prejudicial to his case at the hands of the employer's medical man he should have it in his power to insist on the presence of a medical referee, who would have the qualification of being able to appreciate the result of the various steps taken by the medical examiner, and who would consequently assist in establishing the truth afterwards in a more satisfactory manner than the registrar of the court or any other non-medical official.

In making the above suggestion we do not express any opinion as to the necessity for any change beyond saying that it is manifestly undesirable that there should be any genuine misgiving in the workman's mind as to the fairness of the treatment which he will receive in claiming the full measure of that which the law allows him. He is not to blame because the legislature has treated him so kindly that he or his dependents may obtain compensation for the effects of his own wilful misconduct, if only those effects are sufficiently severe. Nor is it his fault that he has had granted to him compensation much needed by him in cases of genuine and unavoidable injury side by side with the temptation to court "accidents" by negligence and to prolong and exaggerate the incapacity resulting from them. On the other hand, none can blame the employer if he, on his side, seeks to minimise the heavy expense recently added to his burdens, and in the circumstances if it should be found desirable to have any third person present at medical examinations made by either side the cost should be borne, not by the employer or by the workman, but by the public. We speak of a medical examination made "by either side" because we would remind advocates such as the gentleman who denounced the methods of Dr. COLLIE that there are two sides in these proceedings. If the workman requires protection against the medical man provided by the employer it may be urged that the employer also may need to be safeguarded against the medical adviser of his injured servant. If the former is to be observed and checked in the examination by which he prepares himself to give evidence, why not the latter? The one is liable to be accused of being too severe or too insidious in the methods by which he tries to ascertain the truth, but the latter is equally open to the allegation that he is too lax in his procedure or too indifferent as to whether he may be deceived or not. No doubt other plans may be put forward in addition to that which we have suggested to frustrate the attempt at malingering by the workman, and at the same time to exclude any doubt as to the fairness of his treatment. One of these prevails in Germany, and is referred to with approval by Dr. COLLIE in the paper mentioned above. In Germany the suspected malingerer has to enter a hospital for the purposes of observation, and such a system, coupled with the power to inflict a severe penalty upon the would-be deceiver, would be perfectly fair and reasonable. It would do much, moreover, to remove from the working-classes the stigma which their more honourable members no doubt resent, but which must rest upon them when out of the claims made for compensation a substantial number are found to be supported by exaggeration and deceit.

Annotations.

"Ne quid nimis."

FOOD PRESERVATIVES.

IN a report recently presented to the Sanitary Committee of the Corporation of London Dr. W. Collingridge, the medical officer of health, revives once more the very serious question of the unrestricted employment of preservatives in food. In his opinion, in all cases where preservatives are added to articles of food and drink, not only the nature of the drug used, but the amount, should be notified to the purchaser, and further, he would make the use of any preservative in milk a penal offence. There can be little doubt that the neglect of the Government to give practical effect to the recommendations (although in the opinion of a number of authorities these recommendations were not forcible enough) of the Departmental Committee on the Use of Preservatives in Food, which reported in 1901, has been responsible for the present practice of adding preservatives to food without discrimination of any sort being made. The worst aspect of the present position in our opinion is the use of powerful antiseptics to give tainted articles of meat an appearance of soundness. Dr. Collingridge presents a serious instance of this kind. The following suggestive hint is given, for example, in some instructions for use sent out by the makers of a certain dry antiseptic food preservative: "The required quantity varies according to the class of article, a superior article requiring less than an inferior one." Since, as Dr. Collingridge points out, these instructions relate to the use of this material in the manufacture of sausages, pork pies, &c., the above quoted passage can only mean one thing—viz., that inferior meat (? tainted meat) can be used if a larger amount of the preservative is added. Again, certain preservatives intended for keeping milk contained carbonate of soda, which is, of course, present with the view of neutralising any lactic acid formed which naturally curdles the milk. As is pointed out, the development of the bacteria is in no way hindered by the use of carbonate of soda which must be regarded as harmful, seeing that it permits of a milk being in an advanced stage of decomposition without the appearance indicating the fact. The list of preservative powders sold for the preservation of various kinds of foods is really appalling, and something ought to be done to prevent the widely prevailing practice. The variety of food so treated is so wide, in fact, that it is possible that the consumer may be confronted with chemicals at every single meal of the day. He may have borax for breakfast, benzoates for lunch and tea, and salicylic acid for dinner. It is conceivable in such a case that, even if limits were placed upon the quantity of preservative present in each article of food, by the end of the day the individual would have taken a good average dose of a probably irritating drug. In the matter of the use of preservatives in food there is clearly something wrong with a very important branch of our public health administration, and our legislators should see that more efficient measures are applied for the protection of the public from an injury which it is impossible for them to guard against. We commend particularly to the notice of our legislators the following sentence in Dr. Collingridge's report: "I may add that some advertisers are ready enough to quote from the report of the Committee on Preservatives in Food when it suits their purpose, but suppress anything it may contain that is against their interests." The present legislative machinery, if it cannot stop the abuse of preservatives, should obviously be scrapped and new works installed.

RAINFALL AND SUNSHINE: JUNE TO AUGUST, 1910.

—	*Days with rain.	Difference from average.	Total fall.	Difference from average.	Number of hours of sunshine.	Difference from average.
			ins.	ins.		hrs.
London	50	+11	6·2	−0·9	413	−105
Manchester	50	?	12·3	?	395	?
Liverpool (Bidston)	53	+ 7	9·1	+1·0	530	?
Nottingham	49	+ 2	7·4	−0·1	446	−178
Birmingham	42	− 1	8·8	+0·8	394	−85
Buxton	45	+ 3	14·9	+2·7	521	?
Harrogate	47	+ 2	10·3	+2·3	480	−82
Bath	44	+ 7	12·5	+4·7	508	−81
Nairn	58	+ 7	8·5	+1·2	393	?
Aberdeen	50	0	5·6	−2·3	448	−55
Scarborough	48	+ 5	8·2	+0·8	407	−102
Skegness	45	?	7·9	?	467	?
Yarmouth	42	+ 2	7·0	−0·1	543	?
Felixstowe	45	?	6·8	?	586	?
Clacton	39	+ 4	5·8	+0·2	510	?
Margate	48	+12	8·4	+2·5	458	−132
Folkestone	40	?	6·9	+0·3	578	?
Brighton	46	+ 8	7·1	+0·8	555	−121
Sandown, Isle of Wight	43	?	7·9	?	529	?
Weymouth	40	?	6·9	?	523	?
Bournemouth	39	?	8·8	?	546	?
Jersey	48	+ 8	9·3	+2·4	589	−145
Scilly	58	+11	8·8	+1·9	555	−129
Pembroke	57	+13	9·7	+2·1	542	−84
Aberystwyth	—	—	—	—	435	?
Llandudno	50	+ 7	9·3	+1·8	567	+11
Rhyl	49	?	8·5	−1·6	573	?
Southport	49	?	10·7	+1·9	576	−10
Blackpool	48	+ 8	11·7	+2·9	606	+54
Birr (Ireland)	60	+10	11·2	+1·7	430	−21

* Days with at least 0·01 inch.

The three summer months which ended with August deserved nearly all the recrimination which was heaped upon them. They possessed, however, some favourable features, not in spite of, but because of, their very unseasonableness. If they refused the agriculturist the usual hot spells, with a shade temperature of 80° and above, to make his hay and give him an early harvest, and sent him instead a cool, humid atmosphere, dull skies, and inopportune downpours, the lack of ordinary heat and the frequent cleansing of the atmosphere did much to limit the amount of illness due to the usual summer maladies and maintained the death-rate at a relatively low figure. Almost everywhere the rain was more frequent than usual and the aggregate quantity was above the average. The only places without notable excess of rain were London and Aberdeen, but in the metropolis the number of days on which rain fell was 11 in excess of the normal. Over the kingdom generally a measurable amount of rain was recorded on rather more than half the number of days in the period, the smallest figures being 39 at Bournemouth and Clacton and 40 at Weymouth, and the largest 58 at Nairn and the Scilly Isles and 60 at Birr (King's County). At places along the western coasts of Ireland and Scotland rain was, of course, more frequent and also heavier. Among the localities with the lowest total fall was London, with 6·2 inches, the only places with a lower figure being Aberdeen and Clacton. The highest figures were in the Peak region, represented by Buxton, the north-west of England, Bath, and central Ireland. Considering the great number of days on which rain fell the total amounts were not excessive, and this is partly due to the fact that really violent thunderstorms were relatively few. During a hot summer an occasional bad thunderstorm sometimes brings an inch or two of rain over a wide area within a few hours. Figures are hardly needed to show that the summer lacked sunshine any more than they are to prove that it was lacking in warmth. Of all the principal meteorological stations there are only two without a deficiency—generally very large—of the welcome and valuable asset of sunshine. The fortunate spots with an excess were Blackpool and Llandudno, and at the former resort the total number of hours was higher than at any other place. In London, where the bright summer of 1908 yielded 616, and the poor summer of last year 473 hours, there were only 413 hours. At Bournemouth there were 65 hours less than in 1909, and as many as 258 less than in the summer of 1908. Over the country as a whole the figures were between 100 and 200 hours less than during the summer of last year. The unusual lack of summer warmth was, of course, directly due to the almost continual prevalence of cyclonic disturbances which followed each other from the Atlantic with monotonous regularity. For more than a week early in July there was a break in the cyclonic procession from the ocean, but it was only the north-western parts of the kingdom which reaped much advantage in sunshine and warmth, the south and east remaining very cloudy and cool. Considered generally, the mean temperature of the summer was not much below the average. This was, however, entirely owing to the comparative warmth of the nights, very few of which were cold, and many had a temperature above the average. It was the low temperature of the afternoons that was so marked, the shaded thermometer scarcely reaching to 80° in any part of the kingdom, and seldom touching 70°. On a great number of afternoons the readings of the thermometer were between 6° and 10° below the average.

COMPLETE DESTRUCTION OF THE CERVICO-DORSAL PORTION OF THE SPINAL CORD BY A REVOLVER BULLET, WITHOUT INVOLVEMENT OF SYMPATHETIC OCULAR FIBRES.

A CASE of considerable interest from several points of view is recorded by Dr. Victor Cordier of Lyons in the July number of the *Archives de Neurologie*. A young healthy woman, aged 18 years, was shot in the right side of the neck by a bullet from a Browning revolver at a distance of about seven feet, and instantly fell, paralysed and comatose. When examined a quarter of an hour later, at the Hôtel Dieu, she was found to be breathing stertorously, 22 respirations to the minute; the pulse was full, regular, and of high tension, its rate being 80. There was absolute paralysis of all four limbs, with abolition of both cutaneous and deep reflexes. Two hours later the state of coma came to an abrupt termination; the patient began to speak, moved her head easily and without pain, and partook of nourishment readily. The opportunity was taken to make the examination complete. In addition to the quadriplegia there was anæsthesia to all forms of stimuli up to the base of the neck—i.e., to the fourth cervical distribution; the eyes were investigated with the greatest care, and the palpebral apertures were noted as being normal, the pupils were of medium size and equal, and their reactions also were perfectly normal. The cilio-spinal reflex was normal on the two sides. An attempt was made the next day to explore the spine for the bullet, but under the anæsthetic the patient succumbed 24 hours after the injury. At the post-mortem examination the bullet was found

to have penetrated the intervertebral disc between the sixth and seventh vertebræ, and to be lodged in the former. The spinal meninges were perfectly intact, but on incising them at the level mentioned the cord was seen to be completely disintegrated and reduced to a state of pulp, from the fourth cervical to the sixth dorsal segment. The cervical sympathetic was dissected out in the neck and found to be intact. Considering the large extent of the destruction of the cervical cord, it is remarkable that cardiac rhythm and respiration were so little disturbed, comparatively speaking, and the absence of conscious discomfort on the part of the patient during the hours after the recovery from the state of coma is also noteworthy. Of interest from the point of view of military and legal medicine is the nature of the medullary lesion. In the case of spinal wounds caused by projectiles of modern type as a rule either the cord is cut across or fragments of bone are driven into it, or both meninges and cord are simultaneously destroyed. In the present instance another type of lesion, one by no means infrequent, has occurred, a sudden and violent shock producing, as it were, an "explosion" inside the theca but leaving the membranes themselves intact. Apparently the extent of the damage depends on the velocity of the projectile. There can be little doubt that the cause of the destruction of medullary tissues is the violent impact communicated to the cerebro-spinal fluid enclosed in the meninges. In some reported cases even the cerebral hemispheres have been profoundly injured by larger projectiles striking the spine. In view of the site of the lesion the absence of all ocular disturbance is astonishing. The cilio-spinal centre of Budge is probably of secondary importance compared with the bulbar centre for the sympathetic innervation of the pupil and eyelid.

SISTER PROFESSIONS.

ON Sept. 7th at the Church Congress which was held at Halifax, Nova Scotia, Sir Dyce Duckworth read a paper on the Ministry of Healing. In this paper he briefly sketched the attitude of the British medical profession in regard to a matter that at one time threatened to be a subject of contention between the sister professions whose members in their several ways minister to man. There is now evidence that the movement which sought to associate medical men and ministers of religion in a direct and personal ministry of healing by resuming the early church methods of prayer, laying-on of hands, and anointing with oil, has been arrested by the general body of the Church refusing to be led aside from the path of progress. "As a body," said Sir Dyce Duckworth, "our profession holds the Christian Faith, and intends to maintain it. We are in no degree averse from the aid that can often be rightly given by ministers of religion, and we are commonly desirous of securing it in all appropriate cases. We know of no healing of properly authenticated organic disease which has ever occurred in response to spiritual treatment alone." Sir Dyce Duckworth went on to point out that the means of healing which have become available in the course of centuries must be regarded as direct gifts of the Spirit, and that we have to look forward, and not too much back, if we are to make progress and to secure further spiritual gifts. In summing up his paper, he said that as "priests of the body" we gladly welcome any inspiration and assurance that may come from appropriate ministration at the hands of any Christian minister as a reinforcement of our professional efforts, but we are not prepared to act as anointers or thaumaturgists ourselves or to sanction any such efforts as substitutes for the practice of legitimate medicine in cases of disease. "As physicians we witness for a robust Christianity that will stand four-square to all assaults upon the Faith, and believe that such a temper is the one which alone is destined to win its way and spread the simple Gospel of Christ the world over." In conclusion, he expressed the hope that he had uttered nothing in the address which might lead his audience to think that he was uplifted with professional pride or claimed too much for legitimate medicine.

RADIUM.

AS was announced in our columns last week, Madame Curie and M. Debierne reported to the Academy of Sciences, Paris, on Sept. 5th that they had succeeded in isolating radium in the pure metallic state. It is interesting to record that it is a little over a hundred years ago (1807) when a similar announcement was made in regard to the isolation of the two now familiar metals, potassium and sodium, by Sir Humphry Davy, and apparently Madame Curie and her colleague have isolated radium by the same agency, namely electricity. They prepared an amalgam of mercury by the electrolysis of a radium salt. The resulting amalgam was next placed in a quartz tube and distilled in hydrogen under pressure and high temperature. The mercury was then found to have left a thin coating of brilliant metal behind which proved to be radium. As might be expected, the metal acts with great energy; it decomposes water, oxidises rapidly in air, is attracted by iron as though by some magnetic property, and burns paper when placed in contact with it. Radium is thus no longer a hypothetical metal.

FRESH ANIMAL SERUM IN THE TREATMENT OF HÆMORRHAGE.

IN the *Yale Medical Journal* for June Dr. Charles T. Beach has called attention to the value of fresh animal serum in the treatment of hæmorrhage. Schmidt, the discoverer of fibrin ferment, proved that this substance existed in abundance not only in the clot formed on coagulation of blood but also in the serum that separated. In 1907 Weil, a French writer, turned this fact to account and controlled hæmorrhage in hæmophilia by increasing the coagulability of the blood by means of the injection of fresh animal serum. Since that time several observers have used serum, usually with good results. In some cases the antitoxic serum for diphtheria has been used, but without striking success, for, as Weil has shown, the fibrin ferment of blood begins to decompose in about two weeks and then becomes progressively less active. Weil found that the serum of any animal injected under the skin or into a vein reduced the coagulation time of the blood in a subject of hæmophilia, but, with the exception of horse and rabbit serum, animal serums were toxic to man; human serum could be used successfully. Dr. Beach reports three cases in which serum was used as a prophylactic and five cases in which it was used to stop hæmorrhage, two of the latter being examples of hæmophilia, with success. Thus a man bled freely for several hours after tonsillectomy in spite of the usual treatment. Rabbit serum was injected, and within half an hour the bleeding diminished, and soon afterwards it ceased. In two cases of jaundice from cholelithiasis serum was injected and operation performed with little bleeding. In a case of herniotomy oozing from the wound continued for a week after the operation. There was a history of hæmophilia. After injection of serum the oozing stopped, and the coagulation time of the blood fell from 20 to four minutes. A woman had hæmorrhage from the nasopharynx for a week, which was not controlled by packing. Rabbit serum was injected while the nares were packed and the hæmorrhage ceased. It is evident that fresh serum

is a valuable hæmostatic, which may succeed when other remedies fail.

CAPSICUM AND CAPTURE.

THE question whether it is justifiable to bring a quarry to book by means of a suffocating substance has been raised in a recent police case in which the pursued kept the police at bay for four hours in a barred room. Capture was at length effected by placing some smouldering cayenne pepper under the door, the fumes produced being so irrespirable that there was nothing for it but to yield. The magistrate condemned the action of the police, and although the plan succeeded there can be little doubt that the magistrate's view was right, inasmuch as even in the interests of justice the police are not entitled except under great provocation to injure the health of the accused party. The ruse is an old one, but cayenne pepper fumes are decidedly more effectual than mere smoke. Cayenne pepper on smouldering gives off one of the most irritating acrid fumes known. Capsaicin, the chief constituent of the fume, renders respiration well-nigh impossible owing to its intensely irritating properties. As little as half a grain volatilised in a large room will cause all who respire the air of the room to cough and sneeze, and only those who have experienced this property of smouldering cayenne can realise how really diabolical are its effects. The air is impossible to breathe and yet its chemical composition is unappreciably interfered with, oxygen still being present in the usual life-supporting quantity. Similar methods of forcing resignation have played their part in the history of nations in the past, but in this humanitarian age they must be regarded as unpermissible.

MEDICAL ADMINISTRATION IN TRINIDAD.

CONSIDERABLE interest has been aroused in Trinidad by the proceedings of a commission appointed by the Governor of that colony to inquire into the circumstances of an alleged case of plague admitted into the Colonial Hospital at Port of Spain in May last. It appears that the patient, named Sampson, was admitted on May 14th and died on the 16th, and that the hospital staff, from the symptoms of the illness, from the presence of bipolar Gram-negative bacilli in gland tissue obtained by puncture, and from the post-mortem appearances, arrived at the diagnosis of bubonic plague. It was alleged that the surgeon-general of the colony, though notified of the diagnosis, and frequently informed of the progress of the case, did not visit the patient during his illness, and did not declare the case to be plague until May 19th, three days after death had occurred; and that in the interval the usual precautionary measures with regard to contacts and disinfection were not taken. Sundry other matters reflecting on the adequacy of the staff of the Colonial Hospital, on the methods of its administration, and on the conduct of the surgeon-general were also brought before the commission. This was appointed on June 8th last, under the presidency of Mr. Justice A. D. Russell, and concluded its inquiry on August 10th. Pending the publication of the commissioners' report it would be improper to express any opinion as to the merits of the case; but one circumstance that was stated in evidence, and not controverted, calls for remark. Dr. H. L. Clare, the surgeon-general of the colony, is consulting surgeon to the Colonial Hospital at Port of Spain: when the supposed plague patient was admitted to the hospital, the medical man in charge considered the case clinically to be plague, and took all the necessary measures as regards isolation, &c., using also all the means of diagnosis at his disposal. Apparently, and in the circumstances quite naturally, in view of the important issues involved, he was anxious to have his diagnosis confirmed, and Dr. Clare was urgently requested to visit the patient and give his opinion. This he did not do. We do not know what reasons Dr. Clare may have had for not complying with the request, but if the name and office of consulting surgeon are to have any meaning at all it appears to us that a case of suspected plague, in the circumstances that existed in Trinidad at the time, was exactly one in which it was the duty of the consulting surgeon to attend without delay, give advice, and take responsibility.

CHOLELITHIASIS IN A PATIENT 21 YEARS OLD.

GALL-STONE disease is very rare in patients under 30 years of age, and though cases have been reported even in children they are extremely rare. Even from 20 to 30 old cholelithiasis is seldom met with. In the August number of the *American Journal of Surgery* Dr. A. E. Sellenings of New York City has reported a case where the patient was 21 years old. He had had no previous symptoms pointing to gall-stones, but he was one day suddenly seized with severe pain in the right costal region and with nausea and vomiting, but no jaundice was present. When seen on the third day of illness the abdomen was markedly rigid in the region of the gall-bladder, and there was an increased area of dulness. The temperature was 100° F. and the pulse 82. It was decided to operate, and the gall-bladder was found greatly distended, and when incised much fœtid muco-purulent material was evacuated and 14 stones were removed. The patient recovered rapidly. The bacillus coli was found in the contents of the gall-bladder.

THE AMYOTROPHY OF ACUTE AND CHRONIC RHEUMATISM.

MUSCULAR wasting is a possible complication of every arthropathy, acute, subacute, or chronic, whatever be its cause. The atrophy may be so slight as to escape notice, or it may be so profound as to dominate the clinical picture and surpass in importance the articular lesion which has provoked it. Amyotrophy consecutive to a joint affection was known to Hippocrates, but it remained for surgical and medical investigation during the latter half of last century to analyse the phenomena and suggest theories of their pathogenesis. In *La Semaine Médicale* for July 20th M. Klippel and M. Weil of Paris published a very interesting article on the subject, giving a historical *résumé* and a review of the various hypotheses that have been put forward, and at the same time indicating the poverty of our pathological knowledge of a matter which seems in recent years to have been, comparatively speaking, neglected. Muscular atrophy of rheumatismal origin may be slight, moderate, or severe. The first degree is commonly met with in subacute rheumatism and is characterised by the curious fact that, as a rule, of all the peri-articular muscles only one atrophies. It has long been recognised that contact with a diseased articulation does not affect equally the muscles concerned, and the view was advanced by Charcot that the extensors are apt to suffer most. M. Klippel and M. Weil believe from their clinical experience that for each joint there exists a muscle of election which is the first and may be the only one to undergo changes. At the shoulder it is the deltoid, at the elbow the triceps, at the hip the gluteus maximus, at the knee the quadriceps. Disease of the sterno-clavicular articulation causes atrophy of the pectoralis major, of the metacarpo-phalangeal joint of the thumb, the flexor brevis pollicis. Sometimes the atrophy of the satellite muscle is only partial. In the moderate degree of articular amyotrophy all the muscles surrounding the joint are involved. Thus the whole thenar eminence atrophies where the metacarpo-phalangeal joint of the thumb

is concerned, or the muscles of the thigh and leg in the case of the knee. In the severe degree the remarkable feature is the invasion by the atrophic process of muscles which are situated at some distance from the diseased joint, and are not directly connected with it. Thus generalised atrophy of the musculature of the inferior extremity has been observed as the sequel of an injury to the joints of the foot; gonococcal rheumatism of the left hip-joint has been followed by a similar atrophy of the whole limb; gonococcal arthritis of the right wrist has been the cause of a muscular atrophy of the whole arm, including the shoulder muscles. A still more interesting instance is the case where four weeks after a rheumatic attack invading the shoulder- and the knee-joints on both sides generalised muscular wasting set in, all the limbs and the trunk becoming affected, and only the muscles of the face being left intact. The intensity of this atrophy is not, as a rule, proportional to the duration of the arthritis. Its pathogeny is a vexed question. The theory of functional inactivity is open to grave and obvious objections. The theory of insufficient nutrition of the muscles owing to impairment of the circulation by the articular swelling is equally unsatisfactory. Direct invasion of the muscles by the inflammatory process, or through a neuritis of the intramuscular nerves, is not a hypothesis that has much evidence to support it. To-day most observers favour the theory of the nervous origin of the amyotrophy, some supposing that there is a primary medullary lesion which precedes both the arthritis and the atrophy. But undoubtedly the least unsatisfactory view is that which assigns the atrophy to a secondary place, reflexly produced viâ the spinal cord from the primary arthritic affection. Sometimes the changes in the cord may be purely dynamic, but distinct pathological evidence has been brought forward of material lesions in the anterior horns of grey matter, associated with the arthropathy and determined by it. The way in which the articular inflammation acts on the centres in the cord is still unknown. Among the various clinical symptoms directly revealing the fact that the cord is affected in very many of the cases under discussion are painful muscular spasms occurring at intervals, trophic changes, alterations in reflectivity, myœdema, and in particular muscular fibrillation.

A FRENCH INSTITUTE OF COLONIAL MEDICINE.

THIS institute has been founded to afford to French medical men and others (for it appears from our Paris Correspondent not to be narrowly confined to Frenchmen) theoretical and practical instruction in tropical maladies. The course lasts about two and a half months and the first session will commence on Oct. 13th, ending with the end of the year. Our Paris Correspondent informs us that the new institute has been attached to the Faculty of Medicine of Paris, and that the course will terminate, like the courses in tropical medicine in this country, in an examination and the award to successful students of a diploma in "Colonial Medicine of the University of Paris." The theoretical instruction and laboratory courses will be given at the Faculty of Medicine and the clinical instruction at the hospital at Auteuil (L'Hôpital des Dames Françaises). The various instructors are already appointed; the course of technical bacteriology and hæmatology will be given by Professor Roger, that of parasitology by Professor Blanchard, and that of surgery in tropical countries by Dr. Morestin, while ophthalmic affections will be considered by Dr. Lapersonne, general epidemiology by Professor Chantemesse, tropical pathology and tropical hygiene by Dr. Wurtz, and dermatology by Professor Gaucher in collaboration with Dr. Jeanselme. The cost of the course, including that of practical work in the laboratory, is a little over £7, and there is no fee for entering for the examination. The institution of this diploma is a proof that the French are recognising, as we have for some time recognised in this country, that in the public health of colonial possessions more than half their benefit lies. The toll of valuable life exacted by many of the tropical possessions of the European nations has been in the past so hideous as largely to wipe out the value of those possessions. This fact is now becoming obvious to our rulers, and we may expect in the future that every highly civilised power, when extending its influence to tropical regions, will take pains to safeguard the lives of those whom it sends out and to promote the general health of the community.

PAUPERISM IN ENGLAND AND WALES.

THE half-yearly report of pauperism in England and Wales, issued by the Local Government Board, shows that pauperism was higher in 1909 than in the preceding year until the middle of September, after which a decrease occurred as compared with the corresponding period of the previous year. On Jan. 1st, 1910, the paupers relieved were as follows: Unions in London, 30·3 per 1000; outside London, 25·8 per 1000; and for England and Wales, 26·4 per 1000. If the special classes of insane and casual paupers are included the aggregate of the in-door and out-door relief list is 809,842. Those relieved as ordinarily able-bodied paupers amounted to 142,535 (about 15 per cent. of the total), the not able-bodied, aged, and infirm to 412,896 (43 per cent.), and those relieved as lunatics or idiots 116,508 (12 per cent.), an increase of 1639 over the number relieved on Jan. 1st preceding.

WE regret to announce the death of Mr. John Langton, consulting surgeon to St. Bartholomew's Hospital and the holder at different times of every important office in the Royal College of Surgeons of England short of the Presidency. Mr. Langton, of whom we shall publish an obituary notice later, died at his residence, 20, Bentinck-street, Cavendish-square, on Sunday, Sept. 11th.

THE opening meeting of the Pupils' Physical Society, Guy's Hospital, will take the form of a conversazione, which will be held in the Wills Library on Friday, Oct. 7th, at 8.30 P.M. Sir Samuel Wilks, Bart., who will be supported by the honorary vice-presidents of the society, will receive the visitors, who will consist of past and present Guy's men and other members of the profession.

THE winter session at the University of Liverpool will commence on Oct. 4th, when an inaugural address will be delivered by Professor A. B. Macallum, professor of physiology in the University of Toronto. On the evening of the same day a dinner of the Faculty of Medicine will be held, the chairman being Professor F. T. Paul, chairman of the Faculty.

Mr. Edwin Robert Wheeler, M.B., B.S. Lond., medical officer to the British Consulate-General at Yokohama, has received permission from the King to accept and wear the order of the Sacred Treasure of the third class, which has been conferred upon him by His Majesty the Emperor of Japan, in recognition of valuable services rendered.

Professor Howard Marsh, Master of Downing College, Cambridge, will deliver an address and distribute the prizes on the opening of the winter session of the Leeds Medical Schools on Oct. 4th.

THE PIONEER IN THE HYGIENE OF VENTILATION.[1]

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I WISH to draw attention to the life and work of a great Englishman whose discoveries, although fully appreciated by those few persons who are versed in biological history, are not nearly so well known at the present day as they might be.

It has happened again and again in the history of discovery that some most important advances in a particular science have been made by persons not engaged in the professional pursuit of that subject. No doubt the formal recognition of public health as a science is of quite recent date, but there have always been those who have recognised the paramount claims of that branch of knowledge now embodied as hygiene or preventive medicine. Medical men, as might be expected, have in all ages been interested in measures which tended to the welfare of the community as distinguished from that of the individual only. But persons who were not medical men at all have, from time to time, either made suggestions of permanent value as touching the health of the people, or, going farther, have actually made contributions to the science of such a kind that without them progress in that science would have been greatly delayed. The truth of this is strikingly brought out in the life of one of the name of Stephen Hales, a clergyman of the Church of England, and a man who had neither studied medicine nor taken a medical degree, but who was nevertheless the first person in this country to make any serious attempt to provide for the systematic supply of fresh air to places where it could not enter by natural means.

The Reverend Stephen Hales, M A., D.D., F.R S., was *the* pioneer in the hygiene of ventilation. Mankind apparently did not arrive by "the light of nature" alone at a knowledge of the supreme importance of ventilation. Purely natural instincts *have* guided mankind to some results of great practical importance as regards health; he has long known that certain things are non-edible, certain waters non-potable, but as regards the quality of the air to be breathed and what constitutes impure air, the natural teachings are exceedingly ambiguous. The "natural man" is all right so long as he remains under the open heaven, but as soon as he surrounds himself with four walls he seems not to know he must constantly keep changing the invisible air around him. No doubt it is that because it is out of sight that air is also out of mind, but the fact is there are vast multitudes of people who never conceive of air as a real thing, as real as their meat and drink and just as necessary to be kept fresh. Doubtless the unpleasantness and even danger of moving air known as a draught is the reason why so many persons prefer not to attempt to have any fresh air at all. Even our most capable architects have by no means solved the problem of giving us plenty of fresh air without the concomitant of a draught. All living things vitiate air on breathing it even once, and all living things subsist by the absorption of oxygen. This oxygen being continually abstracted from the air breathed must be renewed from outside sources; thus air *must* be changed. Plants as well as animals need oxygen, and this was what Hales grasped, although he wrote and worked years before oxygen was discovered by Priestley and Lavoisier, and without knowing of Black's discovery of respiratory carbon dioxide. Hales in England and Leeuwenhoek in Holland, neither of them medical men, were about the beginning of the eighteenth century probably *the two* persons who saw more clearly than anyone else in Europe the prime necessity for ventilation—that is, the constant change of air in the neighbourhood of living beings. Hales did a very great deal else in science besides devising ventilators; he was a pioneer in the experimental method in both vegetable and animal physiology a hundred years before physiology as an experimental science existed in this country; as a benefactor to mankind it is not too much to say he is conspicuous in the first half of the eighteenth century. We know little indeed as to his capabilities as a pastor of men's souls, but it is certain he had great solicitude for their bodies; he introduced a water-supply into the village of Teddington; he actually contrived to ventilate the parish church, while his pamphlet against the abuse of alcohol is probably the first of its kind in England—"A Friendly Admonition to the Drinkers of Gin, &c.," published in 1734. This alone would enable him to rank as a pioneer in the advocacy of measures of practical hygiene.

Hales knew that air must be changed, whether air for plants or air for animals, air over grain in granaries, or over water stored for drinking purposes, or air enclosed in hot-houses, or air in mines or in holds of ships, or in prisons or around timber or gunpowder: air must be changed. He knew that fresh air was inimical to putrefaction, mouldiness, mustiness of every kind; he invented an apparatus for blowing air through drinking water stored in ships. Hales had the most definite conceptions as regards this necessity for oxygen without knowing what it was in the atmosphere that sustained life and without knowing in anything like its fulness the meaning and importance of Black's discovery that animals exhaled carbon dioxide from their lungs. For Black's discovery was published only some seven years before Hales died, and it is certain that Hales was not indebted to Black, but, on the contrary, Black was profoundly indebted to Hales. For he wrote: "I was partly led to these experiments by some observations by Dr. Hales in which he says that breathing through diaphragms of cloth dipped in alkaline solution made the air last longer for purposes of life."

In order to appreciate Hales's place in connexion with the discoveries in the chemistry of ventilation, allow me very briefly to recapitulate certain fundamental discoveries made both before and after his time. Carbon dioxide gas was discovered under the name of "*gas sylvestre*" by the Belgian chemist, van Helmont, about the year 1640 Van Helmont thought that when wood was burnt its "spirit," to which he gave the name of "gas," disappeared in a volatile form. The next contribution to the chemistry of ventilation was made by Thomas Willis (1621–75), who clearly laid it down that three things coöperated in the act of respiration—namely, a continual access of air, a constant supply of combustible material, and the continual removal of the products of combustion, for Willis clearly identified chemically the burning of a flame in air and tissue-respiration in a living animal. In 1660 the Hon. Robert Boyle performed the fundamental experiment as regards respiration and ventilation when he showed that long before a vacuum was perfect a sparrow and a mouse had both died and the flame of a candle had gone out. Boyle knew that something besides watery vapour rendered air unfit for further breathing. G. A. Borelli about 18 years later in Italy was the first to estimate what we now know as the "tidal air"—that is, the volume of air taken in and sent out at each breath, an important datum in connexion with ventilation problems. The Cornishman, Richard Lower, had before 1669 perceived that the expired air was noxious and must be removed; were there no need for this change, he writes, "we should breathe as well in the most filthy prisons as amongst the most delightful pastures." The next contribution was made by the Oxford man of science, John Mayow, who, working between 1668 and 1674, virtually discovered oxygen in a physiological sense. He named it "nitro-aerial particles," but he clearly understood that something which was absorbed by the air in breathing produced animal heat, and that that something was the same thing which was the cause of chemical combustion. Mayow died in 1679, and in England nothing was done as regards respiration or ventilation until Hales rediscovered a great deal that Lower and Mayow had known quite well. In some respects Hales was less of a chemist than Mayow, but he caused hygiene to advance to a vastly greater extent because he applied what little theoretical knowledge he had to the solving of problems of very definite practical utility. Less of a physiological chemist than Lower and Mayow, he was nevertheless the discoverer of a method of sustaining respiration in the absolutely irrespirable atmosphere of coal-mines and burning houses. He even suggested that his apparatus might be serviceable to divers; he was the father of all such as descend into "fire-damp" and "after-damp" and "choke-damp," &c., provided with an independent supply of air in an apparatus capable of absorbing one's carbon dioxide. He was the Jubal "of all

[1] The opening lecture in the class of Hygiene (Stage II.), delivered at the Midland Institute, Birmingham, on Sept. 15th, 1910, and fully illustrated by diagrams and portraits.

such as handle" the rescue-apparatus. But we must not imagine that although Hales devised such an apparatus he was acquainted with all the properties of carbon dioxide. For just as Van Helmont in the seventeenth century worked with the carbon dioxide of combustion without being acquainted with all its properties, so Hales in the eighteenth worked with the carbon dioxide of respiration without realising all that was involved in his researches on it. Respiratory carbon dioxide was discovered by Professor Joseph Black of the University of Glasgow in 1754. In point of time nitrogen was the next constituent of the atmosphere to be identified. This was also by a Scottish Professor, Daniel Rutherford, of the chair of Botany at Edinburgh; the year of this was 1772, the man a maternal uncle of Sir Walter Scott. Within two years more oxygen was separated by Joseph Priestley from mercuric oxide under the name of "dephlogisticated air." By 1775 Priestley had found that this gas supported both combustion and respiration, but he did not fully understand all that was involved in his discovery; as we are all aware, it was Lavoisier who knew what he was working with when he had, by the end of 1774, isolated oxygen gas and given it the name which has ever since clung to it. The details of the life of Stephen Hales are neither numerous nor romantic. The son of Thomas, eldest son of Sir Robert Hales of Beckesbourne, Stephen was born in 1677 near the pleasant village of Beckesbourne in Kent, not far from Canterbury. His mother was Mary, daughter and heiress of Richard Wood of Abbots Langley. At the age of 19 he went to Corpus Christi College, Cambridge, where he graduated M.A. and took his B.D. degree in 1711. His early scientific leanings may be inferred from his having studied anatomy, chemistry, and botany as a recreation. As a student he managed to make a cast in lead of the lungs of a dog, and he constructed a "planetarium in brass" or orrery as it was called on Newtonian principles.

Having taken Holy Orders, Hales was presented in 1710 to the perpetual curacy of Teddington in Middlesex; it was here that he carried out by far the greater number of his experiments. In 1718 he was elected a Fellow of the Royal Society, and 22 years later he was awarded the Copley medal, the highest honour in the gift of that learned body. In 1732 Hales was appointed one of the trustees in the newly founded colony of Georgia. In 1735 he was elected one of the eight foreign members of the French Academy in room of the late Sir Hans Sloane at the time of his death President of the Royal Society. The date of Hales's marriage is uncertain; it is thought to have been about 1719; his wife died childless in 1721; he did not marry again. Until within a year or two of his death Hales communicated the results of his manifold researches in the form of papers to the Royal Society. He published independent treatises as well; his classical "Vegetable Statics" saw the light in 1726, and the equally famous "Hæmostatics" or Vol. II. in 1733. Both were dedicated to George II.

Although, then, Hales made researches in, and wrote extensively on, vegetable and animal physiology, on chemistry, medicine, and surgery, it is as a pioneer of sanitation that he must ever live in our grateful remembrance. He did not approach problems in ventilation from the purely theoretical side, but he designed workable apparatus on the principle of the bellows for drawing the air from places particularly badly situated as regards air-supply. The earlier and smaller forms were worked by hand, the latter and larger were driven by a windmill, but the construction of them all was essentially the same as that of bellows for church organs. Hales gives the velocity of the air outflow from these bellows as 6¼ miles per hour.

Hales's first paper on the importance of ventilators in mines, hospitals, prisons, and ships was read to the Royal Society in 1741. In this paper he speaks of "the rancid vapours from human bodies" which inclines us to think that even at this early date there were glimmerings of a distinction between respiratory carbon dioxide and noxious vapours exhaled from the skin and lungs. Certainly it is very interesting to be told that the latest opinion is that the headache and distress of ill-ventilated places are due not so much to carbon dioxide *per se* as to the moisture, the heat, and the volatile organic effluvia. But Hales had grasped the important fact that breathed air must be got rid of and sent outside into the ocean of the atmosphere. At the date of which we are speaking, to be sent to prison was practically to be condemned to die from gaol fever; prisons did not seem to have been ventilated in any way whatever. When a Lord Mayor of London, two judges, and an alderman had all died from gaol fever caught at the Old Bailey sessions, a committee of the Royal Society was appointed to report upon the state of ventilation in the gaols. Hales was one of this committee; it reported that Hales's ventilators should be installed, and by 1749 they were in working order at the Savoy Prison. Between the years 1749 and 1752 four prisoners died there from gaol fever, compared with 50 to 100 per annum previously. In 1752 the ventilators actuated by a windmill were introduced into Newgate Prison; from each apparatus ducts led to 24 cells or wards. The mortality in subsequent years was very markedly decreased.

In 1753 Hales wrote an article in the *Gentleman's Magazine* on the applicability of his ventilators to army hospitals and private houses. Nowhere was his invention appreciated more than on board ship. Ships were at this time floating strongholds of death; what between scurvy and ship fever due to poisoning by bad air, only the most robust men survived for any length of time. By 1755 Hales was able to report improvement to the Royal Society in a most interesting paper with the following title, "An Account of the Great Benefits of Ventilators in many instances in Preserving the Health and Lives of People in Slave and other Transport Ships." Hales received most gratifying reports from ship captains as to the enormous change for the better which had been introduced into the conditions of life in the Mercantile Marine. Thus a Captain Thomson under date, London, Sept. 25th, 1749, writes: "All agreed the ventilators were of great service. The men did not need to be urged to work them. 200 men aboard for a year, pressed men from gaols with distemper, all landed well in Georgia. This is what I believe few transport or any other ships can brag of, nor did I ever meet the like good luck before which ..... I impute to the benefit received by the ventilators." Similar reports came from a Captain Ellis, who made a number of voyages in slave transport ships; he had at one time under his care as many as 312 negro slaves who were all landed alive and well at Bristol. Equally encouraging reports came from the transport ships to Nova Scotia.

Through the instrumentality of the French man of science Du Hammel, Hales contrived to have his ventilators installed in certain prisons in France where English prisoners were confined. The reverend sanitarian closes his paper of 1755 with these words: "..... they little consider that it is a high degree of putrefaction (that most subtle dissolvent in nature) which a foul air acquires in long stagnating which gives that pestilential quality which is called the gaol-distemper, and a very small quantity or even vapour of this highly attenuated venom, like the infection or inoculation for small-pox, soon spreads its deadly infection." Hales is, of course, writing of typhus fever; the pathologists are still uncertain as to the etiology of this fever, but practical sanitarians have all but banished it from Great Britain. We ought not to forget that the initial intelligent stages of the war against typhus fever were undertaken by Stephen Hales; he saw perfectly well that the question of its abolition was bound up with the problems of ventilation generally.

[A drawing of the first artificial breathing apparatus which was capable of absorbing the exhaled carbon dioxide was here thrown upon the screen. Dr. Harris proceeded:]

You will note that it is nothing more than a bladder divided into compartments by four partitions of flannel or linen soaked in a solution of potash. To use the particular form which I show you, the nostrils had to be closed, as they have to be in all mouth-breathing forms of similar apparatus. This particular form held only between 4 or 5 quarts of air, but Hales thought that one containing a gallon of air could support respiration for at least five minutes. Now, it seems to me particularly interesting, in view of the prominence which life-saving apparatus has obtained at the present day, in view of the fact that the Government has already legislated in regard to their use, and is about to legislate on a still larger scale, to know that before 1726 a practical attempt had been made to construct an artificial respiration apparatus. This simple invention is the humble parent of all the various ingenious forms of life saving apparatus at the present day—the Fleuss, the Draeger, the W.E.G., the "Meco," and others—which enable men to remain for upwards of two hours in atmospheres not merely poisonous but actually deadly. As I have told you,

it was this invention of Hales that inspired Black to discover respiratory carbon dioxide. This is not the place to refer even in the most general way to the enormous amount of work which Hales did in founding the science of experimental botanical physiology, but at least you ought to know that it is to him we owe the mercury manometer. Every junior medical student knows that it was Hales who first experimentally demonstrated the magnitude of the arterial pressure of the blood in the living animal (mare), but he made experiments over the whole field of animal physiology, and was well acquainted with previous work both in England and on the continent. He might have been a practising surgeon, so interested was he in the subject of stone in the bladder. In physical science he wrote on earthquakes and invented an instrument for determining the depth of the ocean. He also invented a method for dredging harbours.

In private life Hales was very modest, approachable, genial, and full of pastoral charity. The poet Pope, his neighbour at Twickenham, to whose will he was a witness, had the highest opinion of him personally. Sir J. E. Smith, his contemporary, said of him: "His philosophy was full of piety"; and from all we can gather, although his sermons were very dull, he was by no means lax in the performance of his duties as the pastor of his flock.

In closing this very imperfect account of Hales I cannot do better than quote what is carved below the marble monument to his memory in Westminster Abbey which was erected by the Princess Dowager of Wales, mother of George III.; it will at least let you know what contemporary opinion of him was: "..... above the dead prophet divine Wisdom proclaims—'he was skilled in helping men's troubles, he too in tracing God's works; no lapse of time will weaken your praise, great Hales! or your titles, England is proud to enroll you amongst her noblest sons, England who can boast a Newton.'"

While we congratulate ourselves on having attained to an understanding of the principles of ventilation; on having abolished typhus fever from our hospitals, prisons, and ships; on having devised apparatus for sustaining life in irrespirable and deadly atmospheres, let us not forget that the initial stages in the comprehension of these things were worked out, not by any high placed, well-paid, public official, but by a modest amateur, the scientifically-minded country clergyman, Stephen Hales.

THE BENENDEN SANATORIUM AND INDUSTRIAL INSURANCE FOR THE TREATMENT OF PHTHISIS.

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THE first sanatorium of the National Association for the Establishment and Maintenance of Sanatoria for Workers suffering from Tuberculosis was opened at Benenden in March, 1907. It now contains 68 beds in the main building attached to the administration block, 20 beds in a cubicle pavilion, 11 beds in a second pavilion, and 2 beds in a chalet. The first of these separate buildings (for 20 beds, built and furnished for £900 on Mr. West's designs) was erected by subscription among Post Office servants and was handed over to the association by Mr. Herbert Samuel on Sept. 12th. The second was built by friends of the late Countess Cadogan and is to be handed over shortly. The chalet was given by Dr. Foster Owen and is the one exhibited by him at the Whitechapel Exhibition of the National Asscciation for the Prevention of Consumption. The beds are self-maintained, almost entirely by workers' organisations, the largest and most successful of these being the Post Office Sanatorium Society, organised by Mr. C. H. Garland, its secretary, who is also chairman of the association. This society maintains 35 beds, the cost of insurance being under ½*d.* per week per member (2*s.* per year), the society being a voluntary organisation of postal servants and the subscriptions being deducted by arrangement with the Postmaster-General at the rate of 1*s.* per member half-yearly. The figures of this society prove that 2000 men subscribing ½*d.* per week can easily maintain one bed, admitting an average of three patients a year, and pay all office expenses and the cost of travelling from any part of the kingdom. The London Hospital Saturday Fund retains 15 beds, the Hearts of Oak Benefit Society five beds, the Club and Institute Union two beds, the Manchester Unity Order of Oddfellows five beds, the South London District of Foresters (by a voluntary association), the Royal Oak Benefit Society, the Typographical Association, the Amalgamated Society of Railway Servants, and the Railwaymen's Convalescent Homes one bed each, and the Southwark borough council (under special rules defining the class of patients) five beds.

The friendly societies are unable, under their Acts of Parliament, to erect buildings for such purposes, and, in the present financial position of these societies, the funds available for maintaining beds are limited and have to be most carefully considered. All acquainted with friendly societies' work know that a great number of voluntary levies are continually being made, and it is a question still, after seven years' strenuous education of the members and executives of these societies, how far it is possible for large voluntary associations to be formed inside them for the insurance of phthisis treatment. The only one existing is that in the South London District of Foresters, organised by Mr. Chapman, and it is believed that the educational effect of this insurance in this district has already considerably reduced the annual cost of consumption to the ancient Order.

As advisory physician to the council and as medical superintendent of the institution we always insist upon the educational aspect of the sanatorium, following Dr. Newsholme. This institution in relation to the industrial classes is best defined by the title of a paper contributed to THE LANCET some years ago by Mr. Garland and Dr. Lister—"A National School for Consumptives." This phrase, for which Dr. Lister was responsible, expresses, we venture to think, the point of view that should be adopted in the proposed provision of State-supported sanatoriums. The results so far show that over 80 per cent. of the patients discharged from Benenden in an "arrested" state of their disease are in full work (after six months to two years). Some of those not doing any work are in good health, but out of employment for other reasons.

There is no doubt that the danger of not being employed on discharge causes a certain amount of late application, patients waiting until the disease is comparatively advanced, among the members of all the affiliated societies except that of the Postal Society, whose cases apply earlier, and who can obtain up to six months' leave for treatment with the approval of Mr. A. H. Wilson, the chief medical officer of the Post Office. The postal workers are also selected "lives," and hence, perhaps, more resistant. In addition, the Postal Society has caused a definition of the disease, drafted by Dr. Lister, to be hung in every post-office of the kingdom, with the approval of the present Postmaster-General, Mr. Herbert Samuel, and his predecessors, the present Lord Derby and Mr. Sidney Buxton. The association and the Postal Society are largely indebted to these gentlemen. Fear of the loss of employment on entering a sanatorium is also a factor in producing advanced cases which have to be rejected, the evil day being postponed and money wasted on quack medicines until too late. Postal servants enjoy the advantage of long sick leave, reinstatement if they respond well to treatment, and special allowances by the State in case they are unfit for further service. Few workmen can get such terms from their employers, and the fear of their position on discharge from the sanatorium is also a cause of late application for treatment.

Intelligent understanding by general employers of the enormous educative value to early cases of residence in a sanatorium and its effect on the health, not only of the individual but on his fellow workers (as shown by Mr. Chapman in the Foresters), should be one of the objects in the campaign against industrial tuberculosis. The danger of extra claims (for "aggravation of existing disease") under the Employers' Liability Act and Workmen's Compensation Act which may be feared by some employers does not seem to have arisen in the Postal Service, and is not a

very frequent incident in general insurance claims, even among the large number of untreated cases that exist among workmen. The occasional attitude of employees themselves to sanatorium cases in their ranks, in some cases refusing to work with patients on their return from treatment as "arrested," is also only to be remedied by education. It is not uncommon for applicants for admission to Benenden to be warned even by their medical attendants of the danger of going to live among other cases for a time. This is curious, seeing that so many medical men who have fallen victims to the disease find safety in living with consumptives in sanatoriums, and in regard to the Benenden cases, whose medical attendance is largely by contract work, there is obviously no sordid motive in the advice. The insistence on the infectivity of consumption in newspaper articles and in ill-expressed propaganda is also responsible for the exaggerated popular fear of sanatoriums and of the consumptive patient. For a full solution of the problem presented by the working-class consumptive insurance for treatment is only a minor weapon. A combination of medical, charitable, social, and administrative (probably legislative) efforts is necessary. The sanatorium, whether voluntary or State-supported, has its place as a school for the consumptive and an object-lesson to the community. For the industrial classes it should be reduced, as at Benenden, to its simplest terms, and should always aim at turning out the arrested case fit for work. There will be ample scope for private effort during many years to come in the remedying of those conditions which render the disease infectious in the homes and workshops.

THE POST OFFICE PAVILION.

The Postmaster-General, Mr. Herbert Samuel, M.P., who was accompanied by Mr. Sydney Buxton, M.P., the Postmaster-General in the late administration, visited the Benenden Sanatorium on Monday, Sept. 12th, and formally presented a pavilion of 20 beds which has been erected and equipped by the voluntary subscriptions of Post Office servants who are members of the Post Office Sanatorium Society. The presentation was made on behalf of the subscribers to the National Association for the Establishment and Maintenance of Sanatoria for Workers suffering from Tuberculosis, the Benenden Sanatorium being the first institution belonging to the association. The story given above of the Benenden Sanatorium in relation to industrial insurance and the treatment of phthisis, which has been kindly supplied to us by Dr. Lister and Dr. Wilkins, explains the function of Monday last, which was a very successful one. Mr. C. H. Garland, chairman of the association, presided at a luncheon given in connexion with the ceremony, at which Mr. Herbert Samuel eulogised the work of the association freely, saying that he found that of the number of the patients who came early into the sanatorium two-thirds had the disease arrested, while of these four-fifths were in full work two years later. Mr. Sydney Buxton pointed out that the Post Office service branch, which numbers 45,000 men, were to be congratulated upon their powers of self-help, for the scheme of building had only been launched a twelvemonth. Mr. Garland presented the Postmaster-General with a silver key, and after luncheon that gentleman unveiled a brass tablet commemorating the gift of the building.

INTERNATIONAL CONGRESS OF PHARMACY.

THE Tenth International Congress of Pharmacy, which was held in Brussels during the first week in September, was in many respects the most important international gathering of pharmacists which has been held since the London meeting in 1881. A number of foreign Governments sent official delegates, and pharmaceutical associations from all parts of Europe were represented. The Governments which sent official delegates were those of the United States, France, Italy, Spain, Russia, Norway, Denmark, Sweden, Holland, Greece, Hungary, Japan, China, the Argentine Republic, Guatemala, Chili, Haiti, San Salvador, and the Ottoman Empire. The British Government was not directly represented, but the Pharmaceutical Society of Great Britain sent two delegates, Mr. Edmund White, a member of the Council, and Mr. E. S. Peck, one of the honorary secretaries of the British Pharmaceutical Conference.

The most important subjects under consideration were the standardisation of drugs and galenical preparations and the approximation of analytical reagents, and in respect of these two matters it was the purpose of the Congress to further the work which is being done in the direction of the international unification of potent drugs. Dr. A. Schamelhout, the general secretary of the Congress, in opening the debate on Analytical Methods, pointed out that different methods of analysis give different results; for instance, an opium which gives 10 per cent. of morphine when tested according to the fourth edition of the German Pharmacopœia, gives 12 per cent. when tested according to the third edition. It is therefore hardly possible to lay down international standards for drugs unless the methods of standardisation in the various pharmacopœias are brought into line. Accordingly, he asked the Congress to agree to certain principles on which the work of the international unification of methods of estimation should be proceeded with. After a long discussion, in which a large number of delegates took part, it was decided, on the motion of the representative of the French Government, to request the Belgian Government to summon an international congress for the unification of methods for estimating potent drugs, and to recommend that for the estimation of alkaloids preference should be given to gravimetric methods. There was also a long discussion on the question of the international unification of the composition of reagents, at the conclusion of which it was unanimously decided to recommend pharmacopœial authorities to adopt as far as possible normal reagents or some multiple of normal.

The decisions on these questions constituted the most satisfactory part of the work done by the Congress, but other subjects of universal interest were also dealt with, as, for instance, the sale of proprietary antiseptic preparations and disinfectants. This subject was introduced by a Belgian pharmacist who urged that the sale of these products should be under public control. In the course of the discussion Mr. Peck took the opportunity to refer to the fact that the testing of disinfectants was one of the subjects considered at the Cambridge meeting of the British Pharmaceutical Conference, and while agreeing that it was desirable that the sale of disinfectants should be properly regulated, he pointed out that the English manufacturer of disinfectants seemed to favour that method of standardisation which gave the best result for his own product. The Congress unanimously decided to recommend that proprietary disinfectants should not be sold until they had been officially tested both chemically and bacteriologically. A number of other recommendations were also made, one of which was that the proportion of active principles or the bactericidal power should be stated on the package, and another that the names and addresses of the manufacturer and seller, together with the date of manufacture, should appear on the label.

A debate on proprietary remedies dealt mainly with the question of a system of price protection, from which it would appear that pharmacists have given up all hopes of abolishing proprietary remedies, but are not anxious to sell them except at a profit. Strong protest, however, was made against proprietary remedies advertised in an objectionable manner. Another subject dealt with was the position of pharmacists in regard to pharmacopœial revision. Mr. Vaudin, a Paris pharmacist, urged the desirability of there being a large representation of pharmacists on the committee charged with the preparation of an International Pharmacopœia. He stated that the commission entrusted with the compilation of the forthcoming edition of the German Pharmacopœia consisted of 26 members, of whom one-half are medical practitioners and one-half pharmacists; the revision committee of the Pharmacopœia of the Netherlands is composed of ten members, of whom three are practising pharmacists; the last edition of the Belgian Pharmacopœia was compiled by a commission of nine members, three of whom are practising pharmacists; in France and in the United States pharmacists have a large share in the work of pharmacopœial revision. In the course of the discussion Mr. White explained that in Great Britain pharmacists were not directly represented on the pharmacopœia committee, although they had always been ready to assist the committee with advice on pharmaceutical matters, but he expressed the opinion that on a

commission entrusted with the compilation of an International Pharmacopœia medical practitioners and pharmacists should be equally represented. Most of the other subjects brought forward were of purely pharmaceutical interest, but mention may be made of two papers in which the authors expressed the opinion that courses on the macroscopy, microscopy, and chemistry of natural and pathological secretions should be instituted in schools of pharmacy.

It is interesting to note that, following the example set by the International Medical Congress at Budapest, the Pharmaceutical Congress decided to form a permanent international association, whose headquarters will be at The Hague.

VITAL STATISTICS.

HEALTH OF ENGLISH TOWNS.

IN 77 of the largest English towns 7921 births and 3795 deaths were registered during the week ending Sept. 10th. The annual rate of mortality in these towns, which had been 12·1 per 1000 in each of the two preceding weeks, declined last week to 11·7 per 1000. During the first ten weeks of the current quarter the annual death-rate in these towns averaged only 11·4 per 1000, and in London during the same period the death-rate, calculated on the probably over-estimated population, did not exceed 10·5 per 1000. The lowest reported annual rates of mortality during last week in these 77 towns were 3·2 in Hornsey, 5·2 in Walsall, 5·5 in King's Norton, 6·3 in Walthamstow, and 6·3 in Willesden; the rates in the other towns ranged upwards to 18·5 in Stockton-on-Tees, 20·5 in Hull, 21·3 in Tynemouth, 21·4 in Preston, 22·5 in Grimsby, and 24·4 in Middlesbrough. In London last week the reported death-rate did not exceed 10·8 per 1000. The 3795 deaths registered last week in the 77 towns showed a decrease of 145 from the low number recorded in the previous week, and included 623 which were referred to the principal epidemic diseases, against 720 and 703 in the two preceding weeks; of these 623 deaths, 465 resulted from diarrhœa, 51 from measles, 50 from whooping-cough, 28 from diphtheria, 17 from scarlet fever, and 12 from enteric fever, but not any from small-pox. The mean annual rate of mortality from these diseases in the 77 towns last week was 1·9 per 1000, against 2·2 per 1000 in each of the two preceding weeks. No death from any of these epidemic diseases was registered last week in Hornsey, Hastings, Reading, Smethwick, Wallasey, Rochdale, or Dewsbury; the annual death-rates therefrom ranged upwards, however, to 4·0 in Sheffield, 6·3 in Grimsby, 7·3 in Hull, 7·4 in Preston, and 8·3 in Middlesbrough. The deaths attributed to diarrhœa in the 77 towns, which had risen from 115 to 527 in the five preceding weeks, declined again to 465 in the week under notice; the highest annual death-rates from this cause during the week were 3·3 in Barrow-in-Furness and in Sheffield, 3·4 in Wigan, 5·6 in Grimsby, 6·5 in Hull, 6·8 in Middlesbrough, and 7·4 in Preston. The fatal cases of measles, which had been 77 and 68 in the two preceding weeks, further fell last week to 51, the greatest proportional mortality from this disease being 1·1 in Oldham and 1·3 in West Hartlepool. The deaths from whooping-cough, which had decreased from 79 to 57 in the four preceding weeks, further declined to 50 last week, the highest death-rate from this disease being 1·6 in Gateshead. The 28 fatal cases of diphtheria exceeded by 12 the number in the previous week, and included 10 in London and 2 each in Walthamstow, Manchester, and Newcastle-on-Tyne. The 17 deaths from scarlet fever showed a slight decline from the numbers in other recent weeks, and included 3 in Liverpool, and 2 each in London, Bolton, and Hull. The 12 fatal cases of enteric fever were 5 fewer than the number in the preceding week; of these 12 deaths, 3 occurred in London and 2 in Stoke-on-Trent. The number of scarlet fever patients under treatment in the Metropolitan Asylums Hospitals and the London Fever Hospital, which had been 1423, 1447, and 1455 at the end of the three preceding weeks, had further risen to 1462 at the end of the week under notice; 183 new cases were admitted during the week, against 143, 159, and 183 in the three preceding weeks. The 1009 deaths from all causes in London last week included 114 which were referred to pneumonia and other diseases of the respiratory system, showing a slight decline from the numbers in the three preceding weeks, and being 10 below the corrected average number in the corresponding week of the five years 1905–09. The causes of 24, or 0·6 per cent., of the deaths registered during the week in the 77 towns were not certified either by a registered medical practitioner or by a coroner. All the causes of death were duly certified in Manchester, Leeds, Sheffield, Bristol, West Ham, and in 55 other smaller towns; the 24 uncertified causes of death in the 77 towns included 3 in Birmingham, 3 in Liverpool, 2 in London, 2 in Hull, and 2 in Sunderland.

HEALTH OF SCOTCH TOWNS.

In eight of the principal Scotch towns 865 births and 473 deaths were registered during the week ending Sept. 10th. The annual rate of mortality in these towns, which had been 13·3, 13·6, and 13·3 per 1000 in the three preceding weeks, declined to 13·0 in the week under notice. During the first ten weeks of the current quarter the death-rate in these towns averaged 12·7 per 1000, and exceeded by 1·3 the mean rate during the same period in the 77 largest English towns. The annual death-rates in the week under notice in the eight Scotch towns ranged from 12·0 in Leith and 12·3 in Edinburgh to 14·2 in Greenock and 15·3 in Dundee. The 473 deaths from all causes in the eight towns last week showed a decrease of 10 from the number in the preceding week, and included 69 which were referred to the principal epidemic diseases, against numbers rising from 44 to 93 in the five preceding weeks; of these 69 deaths, 51 resulted from diarrhœa, 8 from whooping-cough, 5 from diphtheria, 3 from scarlet fever, 1 from measles, and 1 from enteric fever, but not one from small-pox. The mean annual rate of mortality from these epidemic diseases in the eight towns last week was equal to 1·9 per 1000, and corresponded with the rate from the same diseases in the 77 English towns. The deaths in the eight towns attributed to diarrhœa, which had increased from 20 to 68 during the six preceding weeks, declined again last week to 51, of which 29 occurred in Glasgow, 13 in Dundee, 3 in Edinburgh, 2 in Paisley, and 2 in Leith. The 8 fatal cases of whooping-cough showed a decline of 2 from the number in the previous week, and included 6 in Glasgow. The deaths from diphtheria, which had been 6 and 7 in the two preceding weeks, declined last week to 5, of which 2 were registered in Glasgow and 2 in Leith. The 3 fatal cases of scarlet fever occurred in Glasgow. The deaths referred to diseases of the respiratory system in the eight towns, which had been 49 and 47 in the two preceding weeks, further fell last week to 42, but were 17 in excess of the number in the corresponding week of last year. The causes of 18, or 3·8 per cent., of the deaths in the eight towns last week were not certified or not stated; in the 77 English towns the proportion of uncertified causes of death last week did not exceed 0·6 per cent.

HEALTH OF IRISH TOWNS.

In 22 town districts of Ireland, having an estimated population of 1,151,790 persons, 633 births and 334 deaths were registered during the week ending Sept. 10th. The mean annual rate of mortality in these towns, which had been 17·1 and 15·2 per 1000 in the two preceding weeks, declined to 15·1 in the week under notice. During the first 10 weeks of the current quarter the annual death-rate in these Irish towns averaged 16·0 per 1000; the mean rate during the same period did not exceed 11·4 in the 77 largest English towns and 12·7 in the eight principal Scotch towns. The annual death-rate during last week was equal to 17·0 in Dublin, 13·7 in Belfast, 13·0 in Cork, 20·4 in Londonderry, 17·8 in Limerick, and 23·4 in Waterford; the mean annual death-rate last week in the 16 smallest of these Irish towns was 12·1 per 1000. The 334 deaths from all causes in the 22 town districts last week were slightly fewer than the number in the preceding week, and included 43 which were referred to the principal epidemic diseases, against 74 and 47 in the two preceding weeks; these 43 deaths were equal to an annual rate of 1·9 per 1000, which was also the rate from the same diseases in the 77 English towns, and in the eight Scotch towns. The 43 deaths from these epidemic diseases in the Irish towns last week included

33 from diarrhœa, 5 from measles, 4 from whooping-cough, and 1 from enteric fever, but not one from small-pox, scarlet fever, or diphtheria. The deaths attributed to diarrhœa in the 22 towns, which had been 54 and 39 in the two preceding weeks, further declined last week to 33, and included 10 in Dublin, 13 in Belfast, and 2 each in Cork, Londonderry, and Waterford. Three of the 5 deaths from measles were registered in Belfast, and 3 of the 4 fatal cases of whooping-cough occurred in Dublin. The deaths in the 22 towns last week included 38 which were referred to pneumonia and other diseases of the respiratory system, against 50 and 40 in the two preceding weeks. The causes of 10, or 3·0 per cent., of the deaths registered last week in the Irish towns were not certified; in the 77 English towns the proportion of uncertified deaths last week did not exceed 0·6 per cent., while it was equal to 3·8 in the eight Scotch towns.

THE SERVICES.

ROYAL NAVY MEDICAL SERVICE.

THE following appointments are notified: Fleet-Surgeons: A. G. W. Bowen and E. Sutton to the *Magnificent*, on recommissioning; J. Mowat to the *Swiftsure;* and P. M. May to the *Glory*, and for special service vessels. Staff-Surgeons: J. G. Wallis to the *Glasgow*, on commissioning; C. R. Rickard to the *Æolus*, for voyage out, and to the *Pandora*, on recommissioning; C. K. Bushe to the *Ganges*, for Shotley Barracks; J. Thornhill to the *Æolus*, for voyage home; W. H. O. Garde to the *President*, additional, temporary; and J. P. Greenhalgh to the *Newcastle*, on commissioning. Surgeons: J. H. Burdett to the *Racer*, additional, for Royal Naval College, Osborne; A. C. Rusack to the *Superb;* F. R. Featherstone to the *Victory*, additional, for disposal; T. F. O'Keeffe to the *Pembroke*, additional, for disposal; W. C. Carson to the *Blenheim*, additional, for the *Swift;* F. C. Searle to the *Agamemnon*, on recommissioning; S. H. Vickery to the *Pembroke*, additional, for disposal, on transfer of the *Vindictive* to the 4th Division; W. L. Hawkins to the Royal Marine Division, Portsmouth; N. S. Meiklejohn to the *Victory*, additional; and P. D. M. Campbell to the *Juno*, on reducing.

ROYAL ARMY MEDICAL CORPS.

Colonel T. J. O'Donnell, D.S.O., has arrived home on leave from India. Brevet-Colonel F. J. Lambkin, from the Military Hospital at Rochester-row, London, has taken over charge of the Military Hospital at Bloemfontein. Lieutenant-Colonel R. S. F. Henderson, secretary to the Principal Medical Officer in India, has joined at Simla from Calcutta. Lieutenant-Colonel T. Daly, from Ferozopore, has been appointed to command the Station Hospital at Dalhousie. Lieutenant-Colonel T. H. F. Clarkson has notified his intention to retire from the service. Major O. L. Robinson, from Meerut, has been placed in charge of the Military Hospital at Kailasia. Major C. J. Healy, from Queenstown, has taken over duty at Tipperary. Major C. E. G. Stalkartt has notified his intention to retire from the service. Major H. E. Winter and Major A. E. Smithson have been granted the higher rate of pay under the provision of Article 317 of the Royal Warrant. Major A. E. C. Keble has arrived home on leave from Gibraltar. An exchange on the roster for service abroad has been approved by the War Office between Captain W. J. Waters and Captain H. G. Pinches. Captain B. S. Bartlett, from Colchester, has been appointed for duty with the Northern Army in India, embarking on the *Dongola* from Southampton on Sept. 21st. Captain F. A. H. Clarke, on conclusion of his course of instruction at the Royal Army Medical College, London, has been posted to the Scottish Command, and has joined at Edinburgh for duty. Captain F. W. Cotton, on return from leave, has been appointed to Barrow-in-Furness. Captain J. T. McEntire, from York, has been posted for duty at Chilwell Park Camp. Captain A. S. Arthur, on return from a tour of service in India at Naserabad, has joined at Stobs Camp. Captain E. T. Potts has been transferred from Harrismith to Pretoria. Captain D. J. F. O'Donoghue has arrived home for duty from the West Coast of Africa. Captain R. B. Ainsworth has been appointed Specialist Sanitary Officer to the Southern Command. Captain P. G. Easton has been placed in medical charge of families at Aldershot. Captain A. R. C. Parsons has been selected as Specialist in Advanced Operative Surgery to the Scottish Command. Captain N. E. J. Harding has been placed under orders for service on the West Coast of Africa, embarking in October. Lieutenant J. W. Houston has been appointed a Specialist in the Prevention of Disease at Belgaum and placed in charge of the local laboratory. Lieutenant J. L. Wood, from Bareilly, has joined at Naini Tal. Lieutenant G. F. Dawson has been transferred from Meerut to Chakrata, accompanying the King's Royal Rifle Corps, to which he is attached for duty in connexion with antityphoid inoculation. Lieutenant P. C. Field, from Aldershot, has been posted to Woking.

INDIAN MEDICAL SERVICE.

Lieutenant-Colonel R. C. Macwatt, Residency Surgeon in the Western States of Rajputana, has been appointed to act as Civil Surgeon of Bikaner in addition to his own duties. Lieutenant-Colonel K. Prasad, civil surgeon of Bhamo, has been granted four and a half months' special leave. Captain H. Innes has been appointed to officiate as Civil Surgeon at Dacca during the absence on leave of Lieutenant-Colonel E. A. W. Hall. Lieutenant-Colonel D. G. Crawford, Bombay, has arrived home on leave. Major W. D. Hayward, police surgeon at Calcutta, has been selected to officiate as Medical Storekeeper to Government at Calcutta, vice Lieutenant-Colonel E. F. H. Dobson, transferred to Lahore Cantonment. Major R. H. Maddox, civil surgeon at Darjeeling, has been appointed to act as First-class Civil Surgeon during the absence on leave of Lieutenant-Colonel D. G. Crawford. Major G. McPherson has arrived home on leave. The services of Captain W. J. Frazer have been placed temporarily at the disposal of the Honourable the Chief Commissioner of the Central Provinces. Captain E. C. Taylor has been posted as Civil Surgeon of Miranshah. Captain A. J. V. Betts has been appointed to act as Deputy Sanitary Commissioner of the Western Registration District, Bombay, pending the arrival of Major J. L. Marjoribanks. Captain W. L. Tafford has joined the Civil Medical Department of the United Provinces. Captain M. Mackelvie, officiating civil surgeon of Puri, has been appointed to act as Civil Surgeon of Darbhanga, vice Lieutenant-Colonel J. G. Jordan on leave. Captain T. H. Gloster has been posted to the Bacteriological Department permanently. An exchange has been sanctioned by the Government of India and the War Office between Captain R. K. White, I.M.S., and Captain A. A. McNeight, R.A.M.C. Captain W. H. Boalth, special plague medical officer, Sagaing Division, has been posted for plague duty in the Meiktila Division, Burma. Captain G. Tate has been appointed a Specialist in Midwifery and Diseases of Women and Children to the 2nd (Rawalpindi) Division of the Northern Army. Captain C. Hudson, D.S.O., has been appointed a Municipal Commissioner for Bangalore.

TERRITORIAL FORCE.

Royal Garrison Artillery.

Tynemouth: Surgeon-Major Hugh R. Bramwell, whose resignation was announced in the *London Gazette* of July 5th, 1910, is granted permission to retain his rank and to wear the prescribed uniform (dated Sept. 14th, 1910).

Royal Army Medical Corps.

3rd East Anglian Field Ambulance: Alexander Graham to be Lieutenant (dated July 7th, 1910).

3rd North Midland Field Ambulance: Martin Hallam to be Lieutenant (dated July 26th, 1910).

Attached to Units other than Medical Units.—Major Charles J. Marsh resigns his commission and is granted permission to retain his rank and to wear the prescribed uniform (dated Sept. 14th, 1910). Captain Philip J. Le Riche resigns his commission (dated Sept. 14th, 1910). Lieutenant Arthur N. Haig resigns his commission (dated Sept. 14th, 1910).

For attachment to Units other than Medical Units.—Henry Edward Sutherland Richards to be Lieutenant (dated June 15th, 1910). Charles Holt Caldicott to be Lieutenant (dated July 22nd, 1910).

DEATHS IN THE SERVICES.

Deputy Inspector-General Charles Morton, R.N. (retired), on August 22nd, in his seventy-seventh year. He entered

the service in 1854, becoming staff-surgeon in 1864, and fleet-surgeon in 1875, retiring with the rank of deputy inspector-general of hospitals and fleets in 1887.

Deputy Inspector-General John Jack, R.N., at Kensington, on Sept. 8th, aged 92 years. He was the oldest surgeon on the retired list of the medical staff of the service. He entered the Navy in 1842, and became a staff-surgeon in 1854, and a fleet-surgeon in 1867, retiring with the rank of deputy inspector-general of hospitals and fleets in 1875. He held the Gilbert Blane gold medal.

Deputy Surgeon-General Frederick Mackenzie Skues, late A.M.D., on August 13th, at Streatham, in his seventy-seventh year. He entered the service in 1855, becoming surgeon in 1868, surgeon-major in 1873, and brigade-surgeon in 1880, retiring with the honorary rank of deputy surgeon-general in 1882.

THE WOMEN'S SICK AND WOUNDED CONVOY CORPS.

The Women's Sick and Wounded Convoy Corps is a body of ladies organised by Mrs. St. Clair Stobart in connexion with the medical department of the Territorial Force. They undertake to serve wherever they may be required, either at home or abroad; in time of war their work will not be on the battlefield, but will commence when the wounded who have been brought from the front to the clearing hospitals have to be transferred from them to the stationary hospitals at the base. The Convoy Corps will nurse the patients during removal, whether by railway, by road, or by water, and will also do duty in rest camps and convalescent depôts. Their training will therefore include not only a certain amount of preparation for duty as nurses in military hospitals, but also instruction in the rudiments of military drill, in camp cookery, in laundry work, in the conversion of ordinary vehicles into ambulance wagons, and in riding. In pursuance of these objects a party of about 50 members of the corps have recently passed a week under canvas at Studland Bay in Dorsetshire, with Mrs. Stobart as commandant. Arriving at Swanage about midday on Sept. 1st they marched a distance of four miles to the camp, where the tents had been pitched by non-commissioned officers of the Royal Army Medical Corps (Territorials) under the direction of Captain Langford Lloyd, R.A.M.C. The organisation and daily routine of the camp were on strictly military lines. Reveillé was sounded by a female bugler at 6 A.M., and from 7 o'clock to 8 30 recruits' drill was practised under two sergeant-instructors. Breakfast was then taken, after which the time from 9.30 to 12 noon was devoted to stretcher-drill, bandaging, and field-work under Captain Lloyd and his assistants. Dinner lasted from 1.30 to 2.30 P.M., and from 2.30 to 3.30 P.M. instruction was given in some subject connected with the work of the corps, after which the remainder of the day was at the ladies' own disposal until the lights were extinguished at 10.15 P.M. A camp guard of eight ladies was on duty all night, sentries being posted as in an ordinary camp. The Women's Sick and Wounded Convoy Corps has the approval of the War Office and the British Red Cross Society; and the list of vice-presidents, which is headed by Sir Alfred Keogh, late Director-General of the Army Medical Staff, contains the names of many influential persons.

THE MILITARY FAMILIES HOSPITAL, DEVONPORT.

The building of the Military Families Hospital at Devonport is being reconstructed and considerably improved, and several additions are being made to it. A nurses' quarter to provide accommodation for five resident nurses is also to be erected. Previously only one nurse slept at the institution.

NIGHTINGALE MEMORIAL FUND.—The scheme initiated by Mr. J. Gadesden Wainwright, treasurer of St. Thomas's Hospital, for raising funds for a memorial to the late Miss Florence Nightingale, is progressing rapidly. Already several hundreds of pounds have been subscribed, and a committee, consisting of the chairmen of most of the London hospitals, has been formed. The memorial will probably take the shape of a fund for the assistance of nurses who have fallen upon evil times, but many other suggestions have been made and will be considered. Contributions may be sent to Mr. J. G. Wainwright at St. Thomas's Hospital, or to the secretary of the Union of London and Smith's Bank, E.C.

Correspondence.

"Audi alteram partem."

COLD-BATH TREATMENT OF INFANTILE CONVULSIONS.

To the Editor of THE LANCET.

SIR,—There is no doubt in my mind as to the correctness of the views expressed by Mr. M. G. Pearson in the *South African Medical Record* as alluded to in THE LANCET of July 16th, p. 180. I had not thought that there was anything new in these views, but I will accept the opinion that it is not generally held that infantile convulsions are in most cases due to hyperpyrexia.

For many years I have regarded high fever as the cause of the convulsions in acute diseases in children, and I have acted accordingly. Time after time I have noted that rigidity, twitchings, and convulsions become established *pari passu* with the progressive rising of the temperature, and that they subside *pari passu* with a lowering of the temperature. The rectal temperature is the best guide as to the child's condition. The younger the child the more readily does its temperature become hyperpyretic and the more readily are convulsions produced. At birth the heat-regulating mechanism is not fully developed, and the infant is in the echidna-like condition of depending to some extent upon its surroundings for the maintenance of the proper temperature. The full heat-regulating power of the adult, which is able (except in rare and exceptional circumstances) to keep the temperature within safe limits, does not seem to be acquired until later. I make this statement roughly from my clinical experience, which gives me the impression that beginning with great instability in infancy, so that slight infections may cause very high fever, the heat-regulating mechanism year by year becomes more and more efficient, but that not till about the time of puberty does there seem to be gained that great stability of the regulating mechanism of the adult which renders hyperpyrexia and hypopyrexia so uncommon except in the most severe types of infection. My clinical experience of many years enables me to endorse every word of the abstract of Mr. Pearson's article in THE LANCET. The onset of convulsions when the brain and spinal cord are not themselves the seat of the disease can be anticipated and prevented by careful taking of the temperature in the rectum at frequent intervals, and the use of tepid sponging of the naked body, or the cold bath, as circumstances indicate. As the heat-regulating mechanism gets so easily out of joint in very young patients, the cold bath must be used with caution, as it is easy to produce over-cooling. In every case of fever in a young child the parents or attendant should be instructed to watch for the slightest signs of rigidity of the hands, arms, legs, or eyeballs, and to sponge the child all over at once and keep it wet and naked when these symptoms appear. I always liken in my own mind the convulsions of fevered children with the "heat stroke" one sees in adults in India and other hot countries, the explanation of which is yielded by the experimental researches of Pembrey, Boycott, and Haldane.

The foregoing theory as to the relative efficiency of the heat-regulating mechanism at different periods of adolescence can be tested by direct experiments on infants and children in the heated moist chamber. The further question as to whether the mechanism in the young is more easily deranged by toxins than in the adult would have to be answered by experiments on animals.

I am, Sir, yours faithfully,

W. E. MCKECHNIE,
Captain, I.M.S.

Etawah, India, August 1st, 1910.

"606."

To the Editor of THE LANCET.

SIR,—The thanks of the profession are due to you and to Mr. J. E. R. McDonagh for the article upon the latest new remedy for syphilis which appeared in THE LANCET of Sept. 3rd. It is surprising how little notice the British medical press has taken of the papers which have appeared in the German medical journals during the months of July and August recording the experiences of selected observers who

have been working with the Ehrlich-Hata specific for syphilis. Revolutionising discoveries in medical and allied sciences have succeeded each other with such startling impetuosity during recent years that medical men are in danger of losing the faculty of surprise: nevertheless the accounts of apparent cures—as attested by some of the most eminent authorities in Germany—are of such a nature as to arrest the attention even of the most apathetic.

We read of severe cases of syphilis running their course uninfluenced by mercury administered in the most approved fashion, showing marked retrogression of symptoms within a few *hours* of the introduction of the remedy. We are told that patients whose lesions swarm with spirochætes before the exhibition of the specific fail to yield any of these organisms 24 or 48 hours after its employment. But to my mind the most hopeful record yet published is the account of an experiment performed upon apes by Dr. Neisser, who has such vast experience in this field of research. Syphilitic apes some time after the initial symptoms had disappeared were treated with the Ehrlich-Hata specific. One month later they were reinoculated with human syphilitic material, and after the usual incubation period presented typical primary lesions.[1]

This wonderful result may be explained away in the course of time; meanwhile, we may with reason hope that the genius of Ehrlich has conferred a blessing upon mankind which will rank with the greatest achievements of medical science.

I am, Sir, yours faithfully,

Birmingham, Sept. 12th, 1910. ARTHUR LOXTON.

A WET DAY AT AN AIR AND WATER CURE.

To the Editor of THE LANCET.

SIR,—Some diseases are said to move in vicious circles. An air-cure in France at a fashionable "*bain*" forcibly illustrates this, for immemorial Gallic custom militates often against the most approved modern therapeutics and prophylactics in a manner that must prove the despair of enlightened French practitioners. These lines are being written in a hermetically-sealed salon, heavy with the exhalations of seldom-washing humanity and of phthisical patients who do bathe, but who have sat in rows on sofas during hours of a gloomy and rainy day among the mountains. The salon, which has not a ventilator or practicable window anywhere, and is lit by a dim ground-glass skylight, opens into another room, stuffy with the aroma of particularly active children. This drawing-room also *never* has its windows opened; the parents of the children take good care of that. This hotel, which is the resort of *baigneurs*, many of them consumptive, is certainly built on modern hygienic principles. The bedrooms are austerely clean, and the mania for rounded corners has even spread to the insides of the night-tables. Everything from walls to furniture is made to wash, but, on the other hand, there is no bath-room in the house, and there is no sign of a bath. Closets are on the English principle, but some of them open into unventilated air-shafts. The "w.c. à l'Anglaise" has had a hard struggle to establish itself in France during the last two decades. It is still the subject of sarcasms from patriotic pens in the newspapers! Indeed, to many French minds English cleanliness is a form of Pharisaism and is not loved. The ritual of the mineral-water baths here seems to be interwoven with survivals, such as the "*bassanoire*," or warming-pan, perhaps traceable to a Roman source. It would be interesting to examine into what the French call the *provenance* of all the bathing customs and beliefs here and elsewhere. How many of the practices at a "*bain*" are really merely old-world survivals? Venerable absurdities and immemorial bad customs in the matter of ventilation and cleanliness do not promise well for the cure of incipient consumption, which in France, at least, seems to a great extent to be a self-induced disease due to mollycoddling, rich and unwise diet, lack of fresh air, and life-long *bathlessness*, if I may be allowed to coin a word. In the writer's early youth the French child of a well-bred stock was most perfunctorily cat-licked by his nurse in the morning. We remember one worthy soul who with a slightly-damped sponge made a sort of segmentary dab over her little charge's face at 7 o'clock in the morning. It was always a toss-up whether the half-moon of damp would be on the other side of the small face the morning after. Then there were ancient grandmotherly restrictions as to eating fruit. Even the ripest was to be taken very gingerly. To drink water when you were hot was considered very dangerous. There was in our family a tradition of an ancestor who, in 1793, or thereabouts, had drunk cold water when heated by exercise, and had at once felt an awesome pain inside his vitals. The procedure was to take two or three sips, or about a teaspoonful at a time, and thus the honest thirst of infancy, a thing to dream of in after life, was never satisfied. Spinal curvatures, irregular teeth, and dirty nails were also much neglected. Of course, with the march of civilisation things are improving, even in ultra-conservative France, but our brilliant neighbours will be long in wholly adopting the standards in matters of personal hygiene which prevail in countries otherwise far behind them. They would think it affectation to do so.

I am, Sir, yours faithfully,

Sept. 12th, 1910. JOHN BULL, M.D.

[1] Berliner Klinische Wochenschrift.

THE SUPPRESSION OF QUACKERY.

To the Editor of THE LANCET.

SIR,—As a non-advertising unregistered dental practitioner of 16 years' standing at the one address, and an old and interested reader of THE LANCET, and having received an intimation from Mr. Morton Smale that this vital question might well be ventilated in your columns, and he not making any specification that the reader should be duly qualified either medically or dentally, I beg to take advantage of this courteous intimation to ask you to kindly insert this.

On reference to the Dental Directory, 1910, I find Mr. Morton Smale holds what every British dentist ought to hold—the Conjoint qualification in medicine and dentistry. Probably the duly qualified medical practitioner will think these are peculiar utterances from one of the regimental order of quacks. But all existing quackery in the embryo I lay to the door of the late governing medical bodies; had the curriculum prescribed been, as in many countries, that to become a dental practitioner necessitated the holding of a medical and dental qualification, there would not have existed any quackery to-day. But in many civilised countries, as dental science has advanced, provision has had to be made for unregistered practitioners.

One of our cleverest physicians' pet remark was: "There is an antidote to every disease." The present existing antidote no doubt is severe. But the greater the severity of the disease the deeper and longer the incision, and we will hope that the wound will be entirely healed by first intention. And, furthermore, I can assure you that at least 50 per cent. of unregistered dental practitioners would welcome a registration, and entirely submit themselves to your governing bodies. And might I be allowed the presumption to submit to you through the medium of your very well-known journal a few condensed proposals, to be added to or subtracted from by the governing bodies, viz.:—

1. The existing unregistered dental practitioner that shall produce proof of having practised dentistry for the past three years or more shall, on six months' attendance (*sine* curriculum) at the nearest dental hospital, receive a certificate of the title of "Dentist."

2. Should he on receipt of the title of dentist be desirous, he shall pursue the curriculum required by the governing bodies, and after classes and lectures, hospital attendance of two years' duration, he will be allowed entry to his Final Examination, equivalent to the present L.D.S. (You would find many unregistered taking advantage of the proposal.)

3. The unregistered dental practitioner of advanced years, who could not well take advantage of this proposition, would on receipt of the certificate of the title dentist receive the same privileges as the registered dentists of 1878, viz.: (1) Exemption from juries; (2) duly qualified medical practitioners to be permitted to administer any general anæsthetic necessary, when called upon so to do; (3) the continuing of the right of administration of N_2O and oxygen, or any equivalent anæsthetic of a similar nature that in future may be used in dentistry; (4) the use of local anæsthetics, embracing all that are in present and future use

as local anæsthesia; (5) in granting this certificate of the title of dentist only will make a distinction between the graduate who through college training can exhibit the title of L.D.S.; and (6) the applicants shall conform to all ethical regulations as laid down by the governing bodies from time to time.

The existing opposing elements you have to contend with are, to say the least—I am bound to put it in the superlative degree—very numerous. There exist at present 40,000 unregistered dental practitioners in the British isles of all descriptions, societies and companies inclusive. Their books will show they are making livings from £100 to £2000 per annum. Should it necessitate financial enterprise to pass a Bill (Parliament permitting), they can command at a week's notice £50,000 without any financial inconvenience to themselves whatever. That is the financial side of the question. Taking your professional side of the question, I can safely assert according to the present state of dental affairs that in another three years a registered dentist of any qualification whatever, unless he has a private income, will not be able to live. My argument lies in the fact that ordinary dentistry is composed of minor operations only; excision of jaws, antrum cases, growths, &c., belong to the region of the hospital surgeon, hence the birth of so many unregistered dentists. And furthermore, in reply to Mr. Morton Smale, who probably has his carriage patients from 10 to 4, he cannot possibly possess any conception of the dental requirements of the middle, and especially the lower classes in the North of England; so the sooner fresh legislation is issued the better for all concerned in the practice of dentistry.

I am, Sir, yours faithfully,

August 29th, 1910. SINE IRÂ ET STUDIO.

EPIDEMIC POLIOMYELITIS IN THE UNITED STATES.

(FROM A SPECIAL CORRESPONDENT.)

THIS disease, which has prevailed since 1904 in New England and since 1907 in New York State, has now reached the capital, and there are estimated to be already nearly 200 cases in the city and surrounding country. So much alarm has been created by the sensationalism of the newspapers that the Medical Association of the District of Columbia met in special session on August 23rd in order to consider the situation and attempt to reach a common understanding from which they might formulate a statement to render uniform the advices which are reaching the public from irresponsible sources. The matter was taken up as follows: Epidemiology, Dr. L. T. Royster of Norfolk, Va., the secretary of the Pediatric Section of the American Medical Association; Bacteriology and Pathology, Dr. John F. Anderson, director of the Hygienic Laboratory of the United States Public Health and Marine Hospital Service; Symptomatology, Dr. G. N. Acker, visiting physician of the Washington Children's Hospital; Differential Diagnosis and Treatment, Dr. Tom A. Williams, neurologist to the Epiphany Dispensary; Washington Preventive Measures, Dr. W. C. Woodward, health officer of the District of Columbia.

Dr. ROYSTER was inclined to believe that the present outbreak was an epidemic analogue of a sporadic disease rather than a new malady. He emphasised the comparative frequency of meningeal and encephalitic incidence of recent epidemics. He believed that until they had clearer knowledge of the manner of contagion it was better to err on the safe side with regard to precautions against infection. No promise was yet afforded by attempts at attenuation of the virus with which to furnish a useful preventive inoculation; but the labours of the Rockefeller Institute had added a very great deal to their knowledge of the transmissibility of this disease, and the work was a striking illustration of the value of such laboratories.

Dr. ANDERSON emphasised the European experiments by which infection had been conveyed by spraying the suspended virus into the nares and by rubbing it on to the bruised nasal mucous membrane. Introduction of the virus into the stomach through an œsophageal tube had also infected animals. It was very important to keep in mind the demonstrated fact that the virus, like that of epidemic cerebro-spinal meningitis, was excreted by the nose. It was also excreted by the saliva. From these experimental facts it should follow that the disease might be conveyed clinically in this way, and that precautions against this possibility should be taken, even although the reported facts did not favour this view at present. But as the virus remained active for a long period and was very resistant to most inimical agents except heat, and as in the laboratory of Levaditi the virus had been obtained from the olfactory bulb as the direct result of infection through the nose, too many precautions could not be taken against the nasal avenue and the conveyance of the disease by the inspiration of infected dust. Hence, the disease should be notifiable in order that minute inquiry might be instituted as to the manner of propagation. The fact that normal sheep serum appeared to have a weak neutralising effect upon the virus and that this could be augmented by inoculation might have a bearing upon sero-pathological researches in the future.

Dr. ACKER described an epidemic which had occurred in 1889, during which he saw about 20 cases in the district. Only sporadic cases then occurred until 1904, when there were 25. He had been much struck by the absence of family infection, never having seen two cases at once in a household. The contagion must therefore be very feeble. He had noticed the frequency of spinal irritation in this epidemic, and he had seen several cases which were mistaken for rheumatism and neuritis, and some for typhoid fever. In some cases the paralysis had occurred only after the subsidence of the fever or after a recurrence. He thought that if all cases were reported the mortality would not exceed 5 per cent.

Dr. WILLIAMS alluded to the need of an accurate neurological technique in diagnosing the more difficult cases, which were not numerous. Some resembled Landry's paralysis; in some meningeal symptoms predominated; in some it was chiefly the brain stem which was attacked, giving rise to a dysergic syndrome, sometimes unilateral, as in a case he shortly reported. In such cases examination of the reflexes was particularly important, but it was sometimes very difficult in children to obtain the muscular relaxation needed to examine these, especially when the meninges were irritated. The failure to respond under these conditions did not indicate absence of the reflexes but error in the method of eliciting them. There were two sources of pain from poliomyelitis: (1) meningeal, and (2) that due to stretching, dragging, and torsions of muscles, fasciæ, and ligaments. The latter was permitted by the atonia which resulted from the neuronal degenerations of the disease. The best remedy for it was early galvanism, to exercise muscle contractivity and preserve tonus. But prolonged suspension in water as recommended by the New York committee which reported upon the 1907 epidemic was also of great value, and something could be done by well-applied slings and pads for the patient in bed. To encourage the voluntary movement which was so important a factor in recovery, the child must be induced to play the kind of games which make a demand upon those muscles which were weakened; and when no visible movement was otherwise attainable, suspension in a bath would often enable the patient to command some otherwise inert muscle bundle. In conducting these exercises, which must be persevered with for months, the psychic factor was of the greatest importance, so that the child could participate with enjoyment and thus make greater and more prolonged efforts.

Dr. WOODWARD believed that could they answer the question of why these outbreaks were occurring throughout the civilised world at this particular time, they might go far towards finding a means for arresting the spread of poliomyelitis. Did it prevail now because the growth of the organism was favoured, or was it because their mode of life rendered them more susceptible? At present they must work empirically, although they could be largely guided by laboratory experiments, which had shown the danger of nasal and salivary secretions. Disinfection of these and the use of different utensils by the patients should be minimal recommendations. But there was always the danger of infection by droplets. They must have more light; and

therefore a collective investigation was called for to supplement that being conducted in experimental laboratories. In this way the present epidemic might afford a means for the elucidation of another problem of medical science.

In the discussion Dr. JOHN A. FOOTE alluded to cases which had been diagnosed as chorea, and thought that many cases, through this diagnosis, escaped detection. After the discussion, on the proposal of Dr. PHILIP S. ROY, the following list of resolutions was published by the unanimous vote of the meeting:—

1. The Medical Association of the District of Columbia convened in special session, to consider the prevalence of acute anterior poliomyelitis which is reported to be rife in the District of Columbia and its neighbourhood, unanimously desire to deprecate the undue alarm which has been excited about this disease. Even in severe epidemics only about 1 person per 1000 is attacked, and 1 death per 10,000 of population is an unusually high mortality.

2. Remembering that infantile diarrhœa claims 1 out of every 25 children who die, and that bronchitis and other respiratory diseases cause the death of 1 in every 40 children who die, making a total in the District of Columbia of more than 400 per annum, it should be obvious how disproportionate is the alarm which is now excited about infantile paralysis. We do know how to prevent both diarrhœa and bronchitis. Precautions against these decimating affections are much more urgent than is a vague terror of poliomyelitis, because—

3. We do not know how to prevent this infection either in town or country, for we do not know in what manner it is conveyed from case to case. But we do know that it is very rarely ever transmitted by direct contact in the same house. We do know that it is just as apt to occur in the country as in the town. We do know that it can only by direct inoculation be transmitted to monkeys, and that the virus of the human disease is not acquired by domestic animals. Some believe that it is carried by dust, others by cracks in the skin, others that it occurs only in low-lying land. We know none of these yet; but we are making a sincere effort to solve this difficult question in common with our colleagues in New York, New England, the Marine Hospital Service and in Europe.

4. As to treatment, we do not feel called upon to issue a statement. Each case may present difficulties, but these can only be met by the physician as they occur.

Such publication marks a step in the public function of the medical profession in the District of Columbia, as it has not hitherto been regarded expedient to issue official proclamations from the medical profession for the enlightenment of the people in matters of hygiene or the prevention of disease, although this has been systematically done in the States of California, Illinois, Massachusetts, and conspicuously Maryland.

BRISTOL AND THE WESTERN COUNTIES.

(FROM OUR OWN CORRESPONDENTS.)

University of Bristol.

THE University of Bristol is to receive £1000 for a scholarship in music or botany to be called the "Vincent Stuckey Lean Scholarship," from the estate of the late Miss Julia Lucy Woodward, of The Knoll, Clevedon, Somerset. Under the same will the Clevedon Cottage Hospital will receive £500.

Bristol General Hospital.

At the half-yearly governors' meeting held at the hospital on Sept. 12th, the President, Mr. Joseph Storrs Fry, alluded to Mrs. Proctor Baker's generous gift of £10,000 for the foundation of a maternity ward to be named after the late Mr. Proctor Baker, for many years president of the hospital, and to a donation of £400 from a lady who wished to remain anonymous. He spoke of certain urgently necessary additions which it was proposed to make if the requisite funds were provided by the public. These would include the maternity department already mentioned, fresh wards for female medical and surgical patients, and a new dental department The present dental arrangements are inconvenient. As Alderman C. B. Hare said, there had been over 2700 dental out-patients in the past six months, and these have to be sent a quarter of a mile to the two houses in the neighbourhood of the hospital which are temporarily used as a dental department. The financial position still calls for improvement in spite of the most rigid economy in administration, and it is to be feared that the adverse balance will reach £5000 by Christmas. The pressure on beds continues to be very heavy and the number of out-patients has for the first time reached over 20,000 in six months. Allusion was made to the death of Mr. R. W. Coë, consulting surgeon to the hospital, at the age of 89 years; and to the formation of registrarships.

Winsley Sanatorium.

Mrs. Proctor Baker's generous donation of £10,000 to Winsley Sanatorium, in perpetuation of her late husband's memory, will enable the committee to pay off all that remains of the mortgage. Half of the donation, already received, has reduced the mortgage to £3300. The finance committee has determined to allocate £150 for its further reduction, and the remaining half of Mrs. Proctor Baker's contribution is expected by the end of the year. This will give the sanatorium a balance on the right side, and the house committee at the last meeting appointed a subcommittee to consider additions and improvements, especially in the form of provision of more suitable accommodation for the medical officer and staff. Dr. L. Crossley, the resident medical officer, reported the sanatorium full, and the requests for admission continuous, numerous, and urgent.

Vaccination.

At the last meeting of the Bristol board of guardians it was reported that for the six months ended December, 1909, 4229 births were registered, 1956 infants were successfully vaccinated, 798 had conscientious exemption certificates, 302 died unvaccinated, 8 were insusceptible to vaccination, 120 were medically postponed, and the "removals" and "cases unaccounted for" numbered 1045. These figures show the great increase in the number of conscientious exemption certificates granted compared with a few years ago. For the first six months of 1910 the "exemption certificates" amounted to 821.

The Remuneration of Vaccination Medical Officers.

The Local Government Board has recently requested various boards of guardians in the West of England to consider the question of the remuneration of their vaccination officers, as owing to the decrease in the number of vaccinations the income from fees has been greatly reduced. The Bristol board of guardians has on two occasions declined to increase the remuneration of its vaccination officers, but the Holsworthy (Devon) board decided to award its officers gratuities, a course which the Local Government Board has sanctioned, urging the guardians in future to increase their fees for each successful case of vaccination, and so to make the remuneration the same as it was before the passing of the present Act.

A Distinguished Bristolian.

Dr. Emily Blackwell, who was born in Bristol in 1826, died at York Cliffs, Maine, America, on Sept. 8th. The deceased was the sister of Dr. Elizabeth Blackwell, and went to the United States when she was 6 years old. She graduated at the Western Reserve College in 1854, and with her sister organised the Women's Medical College of New York Infirmary, and founded the New York Infirmary for Women and Children, the first women's hospital established in America.

The Taunton and Somerset Hospital.

The committee of the Taunton and Somerset Hospital, the centenary of which is being commemorated this year, has issued a strong appeal for increased financial support. Since the foundation of the hospital in 1810 more than 50,000 patients have been treated as in-patients, and 235,000 have attended the out-patient department. The daily average number of occupied beds during 1909 was 93, and 961 in-patients were admitted. The cost of maintenance is £5700 per annum, and the approximate annual income is £3400, leaving a deficiency of £2300, for which the committee has to rely on legacies, &c. The committee hopes that as a result of its appeal the income of the institution will be annually increased by at least another £1000. Meanwhile, part of a sum of £107 raised during the recent carnival held in Torquay will be apportioned to the Taunton and Somerset Hospital, the Taunton and District Nursing Association and the Bristol Eye Hospital also participating.

Death from Acetanilide.

An inquest was held at Teignmouth (Devon) last week in reference to the death of a lady visitor aged 43 years. Evidence showed that the deceased was in the habit of taking "headache powders," and had taken one the morning before her death, which occurred suddenly. Medical evidence showed that the heart, although small, was healthy and that death was due to heart failure. The medical man stated that he had examined one of the powders which the deceased lady was in the habit of taking and found it contained

acetanilide, which was a depressant to the heart, and although the powders were about the most dangerous that could be given for headache, they were sold without any restriction. The jury returned a verdict in accordance with the medical testimony.

Sept. 13th.

IRELAND.

(FROM OUR OWN CORRESPONDENTS.)

Poor-law Reform in Ireland.

THE British Medical Association and the Irish Medical Association have recently decided on a joint campaign in favour of Poor-law reform, in so far as it concerns the medical profession. Each Association has voted a considerable sum of money, and a joint committee has been appointed, with Professor Arthur H. White as honorary secretary. The intention of the committee is to organise professional opinion on the subject and to formulate such a scheme as may be decided on as satisfactory to the profession as a whole. In a circular forwarded to all medical men in the country the committee states that the plebiscite of Poor-law officers taken by the British Medical Association, and that of its own members by the Irish Medical Association, showed overwhelming majorities in favour of reform along the lines of the report of the Vice-Regal Commission. The committee briefly summarises the reforms for which it asks the support of the profession. They are: (1) that the public medical services (except lunacy) should be unified and placed under the control of a board containing a due proportion of medical men elected by the service, with laymen chosen by the county councils; (2) a national medical service entered by examination and administered by this board; (3) payment by the State of adequate salaries progressive according to service; (4) promotion by merit to all positions in the service; (5) the establishment of a properly organised public health service; and (6) a system of hospitals, accessible to all requiring treatment, free from workhouse or pauper taint. The question of the medical attendance in these hospitals on private patients requires special consideration.

The Registrar-General's Report for 1909.

IN THE LANCET of August 6th some of the more important statements from the Report for 1909 of the Registrar-General for Ireland were quoted. The report has now been distributed, and a few further points of interest present themselves. In the table of causes of death tuberculous disease stands highest with 10,594 deaths, or more than 14 per cent. of the total number; heart diseases come next, with 9052 deaths; then, in order, old age, bronchitis, pneumonia, and cancer. The mortality from typhus and typhoid fevers has continued to decline. The former disease, which in 1880 caused 934 deaths, and in 1901 92, was responsible in 1909 for only 43—the lowest number recorded. Typhoid fever in 1909 caused 305 deaths, the average number for the ten years 1899–1908 being 564. 222 deaths were caused by puerperal septic diseases, the average for the previous six years being 210; the total deaths associated with pregnancy or childbirth were 644, or 6·27 per 1000 births, the average for the previous six years being 646. The total number of deaths from all forms of violence was 1858, including 48 from homicide, and 146 from suicide. Of the 146 suicides, 116 were males; 18 of the suicides chose poison, 5 taking carbolic acid and 5 strychnine. Two deaths occurred from anæsthetics.

Dublin Hospitals Tuberculosis Committee.

The Dublin Hospitals Tuberculosis Committee has published a summary of the work done by its district nurses during the past six months. Their experience of this kind of work encourages the committee to support the suggestion made by the Dublin Hospitals Board of Superintendence of the appointment of lady almoners to aid the work of the out-patient departments of the hospitals. In the past six months the three nurses employed by the committee gave attention to 283 cases of tuberculosis, paying in all 3292 visits. In addition to ordinary nursing work and the giving of hygienic advice, the committee helped 11 families to move to more healthy houses, they gave food to 108 families, and were instrumental in sending 66 children of tuberculous patients to the country. In many other ways reasonable help was given.

Health Home at Sutton.

A year or two ago some alarm was roused in the neighbourhood of Sutton, a pleasant seaside resort on the northern shore of Dublin Bay, by the rumour that the Women's National Health Association had purchased the disused coastguard station as a home for consumptive patients. Whatever may have been its original intentions, the association gave an undertaking not to introduce any case of tuberculosis or other infective disease to Sutton, and the station was organised as a "health home," or "preventorium," as it is called. Patients are admitted who are in a delicate or debilitated state of health, but especially those who have been exposed to the danger of infection from tuberculosis. Men are not admitted, but boys up to the age of 15 are eligible. The first annual meeting of the supporters of the institution was held recently, when the report for the year was read, showing a good record of useful work.

Apothecaries' Hall of Ireland: Election of Examiners.

The following appointments have been made for the forthcoming session:—Surgery: Sir Thomas Myles and Professor Conway Dwyer. Medicine: Dr. J. M. Day and Dr. John Lumsden. Midwifery: Mr. R. J. White and Mr. Seymour Stritch. Ophthalmology: Dr. E. Magennis and Dr. R. J. Montgomery. Pathology: Mr. J. L. Keegan and Mr. E. P. Murphy. Hygiene: Sir Charles Cameron and Mr. R. P. M'Donnell. Medical Jurisprudence: Dr. J. C. M'Walter and Mr. W. Fottrell. Materia Medica: Mr. J. D. Crinion and Mr. T. G. M'Grath. Pharmacy: Colonel Adye Curran and Mr. C. J. Powell. Anatomy: Mr. Andrew Charles and Mr. B. Burke Kennedy. Biology and Physiology: Dr. Geo. M. Keating and Dr. Wm. O'Kelly. Chemistry: Mr. J. J. O'Sullivan and Professor Hugh Ryan. Physics: Professor Hugh Ryan and Mr. J. A. Whelan.

Sept. 13th.

ITALY.

(FROM OUR OWN CORRESPONDENT.)

The Cholera in Apulia.

"*In piena decrescenza*" (in full subsidence). Such is the announcement, on official authority, of the day now passing. Good luck has been, though a little tardily, reinforced by good management, and Italy, Southern, Central, and Northern, now breathes freely, as if relieved of an epidemic incubus, present and impending. At the first outbreak of the disease there was, I regret to say, an ignoble stampede of "authorities," syndics, Members of Parliament, aye, and even sanitary officers, abandoning their posts, but there were, particularly among the latter, distinguished exceptions, sustained in their noble stand by the Under Secretary for the Home Department, Signor Calissano. This gentleman, "uomo bonario del buon stampo Piemontese" (a hearty specimen of the good Subalpine stock) was the hero of the situation, infusing confidence and courage into the population, admirably seconded, moreover, by Dr. Gosio, the bacteriologist of the Direzione Generale di Sanità. Thanks to them and their immediate coadjutors the enemy was not only kept at bay but stormed in its main positions, till even the fugitives repented and came back, and are now swelling the cry, happily not premature, of "victory all along the line." That there were culpable negligence and supineness at the beginning may be inferred from the fact that a son-in-law of one of the Apulian representatives in Parliament, days before the presence of cholera was announced, was seized with the malady, but his case was kept concealed till others betraying the same symptoms followed in such numbers that secrecy could no longer be maintained. Frankness ("brutal frankness" even), accompanied at the outset by well-inspired and energetic measures, would have saved not only many lives but one of Italy's most fertile regions from losses which will be severely felt in the coming winter. One lesson peremptorily inculcated by the visitation is this: the water-supply of Apulia must be forthwith made adequate, in purity and abundance, by the aqueduct, long promised but not yet in working. Rome, it is felt on all hands, owes her immunity

from cholera and other epidemics to her magnificent drinking-water, the bequest of her early Kings, carried on and enriched under the Republic and the Empire. Naples, too, has in point of public health become (though late in the day) quite another city since the excellent Serino water has found free course throughout her population. Apulia has long been awaiting a similar benefaction in the introduction of the Sele supply as abundant as it is pure, and her Parliamentary representatives will have the backing of the whole country if they make the completion of the aqueduct which is to diffuse it a question of first instance on the reassembling of the legislature. King Victor Emanuel, meanwhile, at a colloquy in Venetian waters with the Prime Minister, Signor Luzzatti, has had his daily inquiries as to the movement upwards or downwards of the epidemic capped by the intelligence that it was in full subsidence, and, while charging the Premier with a message of congratulation to Signor Calissano for his combined sagacity, energy, and courage in face of the enemy, consigned to Signor Luzzatti the sum of 100,000 lire (£4000) for the institution of "economic kitchens" in the localities most heavily visited by the disease and its sequelæ.

Another Epidemic!

Misfortunes come not singly. Apulia has barely witnessed the wane of the cholera when measles of an alarming type, causing pneumonia in the adults contracting it for the first time, has supervened, Gioiosa Ionica being its headquarters. Always more or less in evidence, thanks to the defective sanitation to which so many communes and cities throughout the kingdom owe their heavy tale of zymotic disease, the "morbillo" in question was aggravated by the excessive summer heat, till in the day now passing "non si contano più gli ammalati" (the patients are no longer to be counted). The official returns of August 30th represent the cases in Gioiosa Ionica alone as 80, with 30 deaths; but in truth there is not a family without its victim or victims. One cause of the rapid spread of the malady is the ignorance of heads of families not recognising its symptoms, all too cognisable, at the outset. Another cause is their reluctance to apprise the sanitary authorities for fear of the inevitable lazzaretto and the house-to-house disinfections. Popular prejudice cannot rid itself of the belief that measles can be communicated only from child to child and that isolation is a stupid medical fad. So we have this result—to wit, that after the disease has run a three days' course and is in the period of desquamation the patients are left free to mingle with the healthy, to the jeopardy of the whole community and to the incurring of serious complications, particularly in the adult. Gioiosa Ionica is better off as regards water-supply than many of its neighbours, and it enjoys the pure balsamic air common to all Apulia. But of what avail are these advantages when ignorance, superstition, and the prejudice which springs from both array themselves against medical prescription and sanitary law?

Between Two Epidemics.

Some notion of what the Italian physician has to struggle with, especially in the Southern Provinces now visited by cholera, may be inferred from the reports of the recent outbreak of popular violence at Barletta. Under the delusion that the sanitary authorities inoculate the public with the bacillus to prolong the epidemic and to keep the medical men in employment, the mob assailed the town-hall with volleys of stones, directed chiefly at the "Uffizi d'Igiene"; turned next to the military barracks and "shelled" them in turn with the same missiles; and, finally, when the carabineers had to come out in the interests of public order, received them with such a hail-shower of projectiles, gathered from all quarters, that the long-suffering soldiery had to fire in self-defence, though with blank cartridge. At this the mob took to flight, a considerable number, however, of the more fanatical holding their ground till they, too, were dispersed at the point of the bayonet. "Are we in the Middle Ages?" asks a Subalpine journal, "or is it possible that this is the year of grace 1910?" Meanwhile, the medical men and the sanitary officers have had to keep their houses, targets as they are for the fury of the populace, which, in their absence, has next assailed the pharmacists, one of whom has been so seriously injured that his life is despaired of. There is, in truth, another epidemic raging in the province of Bari besides that imported from the Russian shores of the Black Sea, the epidemic of vague, unreasoning panic, than which cholera has no more effective ally. Explanations are, of course, forthcoming of this second visitation. The impounding of vegetables, more or less suspected, particularly of figs—which enter so largely into the diet of the poor—has deprived much of the population of its favourite food, and more of its accustomed *métier*, and no doubt the stringent observance of orders on the part of the sanitary officers in so acting goaded the ignorant into anger, expressing itself in violence. But the opening of economic kitchens and the gratuitous supply of sound food have minimised the force of this plea; and so the apologists—mainly ultra-Socialist in creed—have had to find another "explanation." And it is this: The "teppista" (hooligan) has seen his opportunity in the popular obsession and has done as he always does on such occasions, "made for the public offices," with a view to plunder or even in a sheer love of mischief. But this explanation has but to be hazarded to be instantly dismissed, and the level-headed, law-abiding citizen is appealing to the Socialist in question to use his undoubted command of the popular ear in a legitimate and salutary direction, that of conveying to it sound advice, such as may be drawn from Dr. Santoliquido's excellent pamphlet on the nature of cholera and the way to meet it and master it. As I write, some such appeal has begun to have effect; work has been improvised for the "disoccupati," thrown out of employment by the enforcement of sanitary regulations; the "cucine economiche," largely reinforced not only by the Royal largess but by the Grand Lodge of Freemasons, are in full blast, and the Prefect and his subordinates, together with the medical practitioners and sanitary officers, can not only venture abroad but are already assured of a cordial welcome, leading up, it is hoped, to sympathetic coöperation.

Wine Adulteration: A Warning.

This year's vintage is so exceptionally poor that the Sanitary Office is already preoccupied with the inevitable exposure to sale of wines more or less adulterated. Members of Parliament are invited, through a circular issued *ad hoc*, to use their influence in strengthening the hands of the legislature for a more stringent enforcement of the law against adulteration. The circular, now before me, concludes with an appeal to the Minister of Agriculture to create a special body of inspectors for the detection of fraud and to issue precise indications for the distinguishing of sound from spurious wine. The importance of this step, which has the support of the wine-growing interest throughout Italy, is obvious in view of the approaching influx of the tourist world, valetudinarian and other.

Sept. 12th.

VIENNA.

(FROM OUR OWN CORRESPONDENT.)

The Cholera Epidemic.

SOON after the epidemic of cholera in Russia spread to the Austrian frontier (as mentioned in THE LANCET of Sept. 3rd) two cases were discovered in Vienna, and considerable alarm among the population was occasioned thereby. In this emergency the Board of Health took prompt measures which were followed by complete success. Both cases were soon traced to their source, everybody who had been in contact with them was isolated, and there has been no extension of the disease. The utmost precautions are being taken to prevent any further admission of infected persons from either Russia or Italy. In ordinary times there is a great importation of fruit, vegetables, and flowers from Italy, while Russian goods, cereals, and sugar come up the Danube in large quantities, but all this traffic has been completely stopped. Austria, therefore, remains beyond the epidemic area for the present, but experts fear that this immunity is not likely to be of long continuance.

Pellagra.

A report of the Board of Health, which was published in the *Sanitätsblatt* some time ago, gave particulars of the successful measures which have been taken with respect to the Austrian focus of pellagra in the Alps. In Tyrol, where part of the population is Italian and the favourite dish is polenta or some other preparation of maize and cornmeal, the Government has erected six bakeries for the supply

of rye bread, under the control of officials appointed by the State. In these bakeries nearly all the work is done by steam-power, manual labour being avoided as much as possible. The products are examined in the State laboratory, and the rye bread is sold at a fixed price, regulated by the Government. In some districts the poorer classes may on application even have it free of charge, but it has been found rather difficult to induce the population to eat rye bread on account of the tenacity with which local customs are adhered to. The results have, on the whole, been fairly satisfactory, although the actual cause of pellagra is not yet known. Other bakeries of the same description have been already established in Bukowina in the eastern part of the empire, where similar conditions are in existence; there also the number of cases of pellagra has fallen very rapidly and the health of the population improved in an unexpected degree.

The Industrial Employment of Females and Young Persons.

The urgent social question of the protection of the weaker members of the working classes in this country has recently been brought to the notice of the Board of Health by a Parliamentary report on the existing laws and regulations. According to this report Austria has served as a model to other countries in some few points, but on the whole it ranks behind Germany, France, England, and Switzerland as regards the amount and degree of protection required by law. The safeguards provided for children employed in factories are satisfactory, and hardly any infringements of the law have been observed in this respect, but outside factories the conditions are not so good. For instance, in public-houses, in shows, and in agricultural labour, the inspectors have often found excessive demands made on children under 14 years old. A Children's Protection Act is, therefore, urgently needed. One defect is the absence of any provision for the gradual lengthening of the hours of employment for young people, so that after reaching the age of 16 years a boy may be at once required to work 11 hours a day just as some full-grown men do. In this respect Austria is lowest on the list of civilised nations. In the mining industries, however, there is a regulation which gives boys an hour's longer rest than men. In some other industries the young workers are allowed half-an-hour's extra rest in the morning and also in the afternoon in addition to dinner-time. The statistics dealing with the morbidity and mortality of females engaged in industrial occupations reveal a very bad state of affairs, and the actual facts are certainly even worse than the official data. Only in very few instances has the 10-hours day been adopted, a working day of 11 or 12 hours being the rule. Urgent recommendations by medical men and social reformers have been made to the legislature to appoint a working day of nine or even of eight hours for females, especially for mothers and housewives, and the advantages, both ethical and sanitary, of such a limitation of female labour have been pointed out, but hitherto without effect. The only concession has been the granting of a full night's rest for females; all shop assistants and apprentices have also a full night's rest provided for by law. In the minor industries there is a tendency to evade the law by giving out work to be done at home, but this will soon be made illegal. A remarkable omission is the absence of any provision for obligatory Sunday rest in trades or occupations with more than 84 working hours per week. The Austrian trade unions have recently appointed a mixed commission, consisting partly of medical men and partly of workpeople, to draw up a series of recommendations which will be brought before Parliament at an early date. In this memorandum special attention will be devoted to the protection of the health of persons employed in dangerous occupations, to the sanitary conditions of the places where they work, and to the exclusion of females and juveniles from such occupations. Special clauses have been drawn up for the protection of working women during pregnancy; the present provisions of the sick club (Krankencassa), to which each worker must belong, are not held to be sufficient in this respect. It is now recommended that a woman shall not resume work until six weeks after delivery and that premiums shall be paid for breast-feeding, whereas the Krankencassa at present refuses any such payments. All these grievances of the labouring classes will no doubt be done away with in course of time, as the State is now awakening to the necessity of improved social conditions.

Sept. 12th.

NOTES FROM INDIA.

(FROM OUR OWN CORRESPONDENTS.)

Dairy Produce in the United Provinces.

THE very unsatisfactory conditions under which milk and butter are produced and distributed in India are periodically the subject of scathing criticism, but, like some other difficult subjects, it has not in the past got beyond the stage of discussion. The matter has once more come to the front in various directions, and on this occasion there are indications that something more than expressions of righteous indignation at existing conditions may result. In Calcutta the municipal authorities are taking measures which are regarded with some optimism by the local press, and a resolution on the subject by the Government of the United Provinces has recently been issued. This resolution deals with the recommendations made by the cattle conference held at Naini Tal last August. Amongst the suggestions made by the conference was that municipal enterprise might be directed towards effecting some reform. The conference proposed that municipalities should provide pasturage facilities out of municipal funds if need be, and that they should encourage private dairies by giving pasturage facilities at cost price. The Lieutenant-Governor of the United Provinces, Sir John Hewett, sees no harm in municipal boards providing general grazing grounds, where such are not available, for which fees should be charged, but he thinks charges of favouritism might be raised if special facilities were given to particular dairy companies. A further recommendation of the conference was that railways should give favourable rates and special facilities for the transport of milk, and private associations near railway stations for the supply of milk by rail should be encouraged. This the Lieutenant-Governor regards as a more hopeful solution of the difficulty rather than the encouragement of milk production within municipal limits. Railway freight rates are, however, so high at present as to be prohibitive for such traffic, and His Honour is going to approach the railway board with the object of concessions being granted for the carriage of milk. For their supply of butter and *ghi* (cooking butter) the Lieutenant-Governor contends that municipalities should rely upon more distant sources, and he would not have these products manufactured from milk produced within municipal limits. The whole of the milk sources within easy reach of urban areas should be utilised purely for milk-supply. The organisation of butter and *ghi* factories is advocated, which would receive pasteurised cream from distant rural areas where large grazing tracts are available, as, for instance, in Central India. It is believed that a profitable business might thus be created for supplying the large cities. This is an admirable theory, but it will not be easy to find private capitalists ready to start the necessary pasteurising stations and factories. Sir John Hewett is quite convinced that neither the initiation nor the adoption of dairy reform is to be expected from the castes who at present control the trade, and he is very doubtful whether any law framed for the supervision of the milk trade would be effective at present, though he approves of steps being taken in any municipality where local opinion is strongly in favour of such legislation. The conference recommended that Government should give *takari* advances to start dairies managed on modern principles, but His Honour does not favour this course, at any rate for the present. Milk supplied from dairies conducted on such lines would probably cost more than that supplied by the present methods, and the commercial success of the dairies must therefore depend on whether the upper and middle classes in the large towns are willing to pay fair prices. It is only actual experience that can give an answer to this question, and Sir John Hewett believes that if the public-spirited members of large cities, such as Lucknow or Allahabad, are earnest there should be no difficulty in raising by private enterprise sufficient capital to equip a modern dairy and make the experiment. "This appears to the Lieutenant-Governor to be the right course," proceeds the resolution, "but if the capital is not forthcoming by this method he will consider the question of granting advances repayable to the Government on easy terms." It cannot be said that the resolution takes us very far towards a solution of the problem, and it commits Government to nothing more

than a sympathetic interest in any efforts on the part of private enterprise which may or may not be forthcoming for the provision of a sound milk- and butter-supply. Progress, however, must necessarily be slow in such matters, and those interested will be glad to be assured that the resolution is not the last word Government has to say on the subject. A more definite pronouncement has been deferred until after the Allahabad Exhibition, the dairy exhibits at which it is hoped will stimulate public interest in the matter.

Vaccination in the Punjab.—Payment of Pensions.

The vaccination statistics in the Punjab for the year 1909–10 by the Sanitary Commissioner have just been issued. There was a small increase of 1638 in the total number of vaccinations performed, notwithstanding the prevalence of plague in the province and the consequent difficulty of successfully prosecuting vaccination operations. The experiment of house-to-house vaccination does not seem to have been entirely successful. The results obtained have been interesting, but in the opinion of the Lieutenant-Governor of the Punjab, although the system is very popular in many districts, it is not suitable all over the province. It fails most in hilly tracts where the houses are scattered about at considerable distances, often difficult of access. Only in those towns and districts where the experiment met with success does Sir Louis Dane propose to continue the system. The municipalities of Delhi, Lahore, and Amritsar will have their attention drawn to the necessity for a stricter application of provisions of the Act. In Lahore, where there is a prevalence of small-pox in epidemic form in most spring seasons, stricter administration of the Act is said to be very necessary.—The Punjab Government is contemplating the experimental introduction of a system for the payment of Government pensions which promises to save pensioners a large amount of trouble and inconvenience. It is proposed to divide all pensioners of certain districts into groups and give each group instructions to present themselves at the district treasury on one of the certain specified days in each month, more than one day being allowed to provide for casualties.

The Increase of Phthisis in India.

The Government of India has addressed to provincial Governments a letter regarding the great increase of phthisis in India of recent years and the proposed establishment of well-equipped sanatoriums for the treatment of the disease in different parts of the country. Provincial Governments are asked what course they consider practicable in this direction, the Government of India stating it thinks the necessary funds will be found by private beneficence.

August 7th.

NOTES FROM CHINA.

(FROM OUR OWN CORRESPONDENT.)

Health of Hong-Kong, 1909.

THE last annual medical report of Hong-Kong is a more satisfactory one from a health point of view than has been the case for a good few years past. With the exception of enteric fever, the number of cases of which was above the average, the year has been singularly free from epidemic disease. The incidence of malaria has been reduced and by-laws dealing with the prevention of mosquito-breeding have been amended by the Sanitary Board so as to make it possible to deal more effectively with their breeding-places. The general death-rate was 21·13 per 1000, as against 27·55 the previous year; the rate among the non-Chinese community was 12·45 per 1000, also a decrease from previous years. This is due to diminished incidence of plague, which was responsible for only 108 deaths in 1909, compared with 986 in 1908. Out of a total of 7267 deaths the following, in order of frequency, are the main causes: pneumonia, developmental diseases, phthisis, beri-beri, malarial fever, paralysis and convulsions, and diarrhœa. While in Shanghai the health authorities think that beri-beri is probably an infective disease having no direct relation to food, it is still thought in Hong-Kong that this disease is due to the eating of white or polished rice. Very active anti-plague measures are kept up, especially in the campaign against rats. A large number of small bins are fixed throughout the city to telephone and lamp standards; these are half filled with disinfectant and the native population is encouraged to put into them all rats they may catch or find dead. Collectors daily visit these bins and ticket and deliver all rats found in them for classification and bacteriological examination. Rat traps and poison are distributed gratis all the year round to householders. Over 76,000 rats have thus been dealt with during the year, of which 507 were found plague-infected. The rats of Hong-Kong are Mus decumanus, Mus rattus, and Mus musculus. It is noted (1) that in all three species the male shows a greater predominance of plague infection than the female; (2) that Mus rattus presents a far larger proportion of infected rats than either of the other two species; (3) the proportion of plague-infected rats decidedly increases in the hot weather and decreases in the cool; and (4) that there is a marked preponderance of female over male rats caught. The report shows (and this is the common experience, so far as I can gather, throughout China) that typhoid fever is much less prevalent among Chinese than Europeans, the ratio of cases to population being in the case of Europeans 2·4 per 1000, and in the case of Chinese 0·018 per 1000. The Government now employs eight Chinese midwives trained in Western methods to attend the poor in their confinements, and during the year 1381 cases were attended by these women. There were 38 cases of small-pox, of which 25 died. 6721 vaccinations were performed, and efforts are being made by means of a clearly worded memorandum drawn up by the medical officer of health, Dr. Francis W. Clark, and issued to school masters and others, to secure the free revaccination of children. In the report of the Tung Wah Hospital there is a most interesting table, too long for reproduction, showing the results of treatment by European and Chinese methods. In this hospital a patient on admission can choose whether he will undergo treatment by European or by Chinese native methods. The total number of cases dealt with during the year was 3932, with the following results: European treatment, 1679 admissions, with 322 deaths; Chinese treatment, 1714 admissions, with 555 deaths. Those of us resident in big cities on the mainland cast envious eyes on the efficient way the work of the Hong-Kong Medical and Sanitary Department is carried on. Dealing with such large numbers of Chinese (over 320,000) the work of Dr. J. M. Atkinson and his staff is a striking object lesson of avoidable mortality and lessened human suffering to which one would fain have the Imperial Chinese Government pay more attention.

The Hong-Kong University.

Sir Frederick Lugard, Governor of the Colony of Hong-Kong, desires to raise further funds for the endowment and equipment of the Hong-Kong University in order to create a sufficient number of faculties to justify its claim to the title of a University. The buildings are already in course of erection by Sir H. Moady, the donor, at an estimated cost of about £30,000, but furniture, fittings, and apparatus for all laboratories remain to be provided. These are estimated at about £16,500, and it is further desired to raise an additional £50,000 for the endowment fund, so as to enable the university to inaugurate all requisite chairs. Those who are interested in the spread of Western medical education in China will learn with pleasure that the chair of medicine is among the first to be established, together with applied science and arts, and that the medium of instruction will be English, in an effort to make it the predominant language in diplomacy and in culture as well as in commerce in the Far East. The enthusiasm exhibited by the Chinese for the establishment of a University in Hong-Kong has been quite astonishing and has far exceeded Sir F. Lugard's anticipations. The appointment of the Governor of the Colony as Chancellor will assure to the University continuity of policy and prestige, and give confidence to the Chinese, both on account of the traditional friendship of the colony with China, and because of the known antipathy of the British Government to all forms of revolutionary propaganda. Chinese students will be enabled to obtain a recognised British degree at a cost of about £60 per annum, as against £200 or £300 now incurred by those who send their sons to Europe or America. They will remain in a Chinese environment and so avoid the denationalisation which a ten years' residence abroad inevitably entails. They will, it is hoped, learn to appreciate British institutions and standards of conduct without discontinuing the study of their own language and literature.

August 12th.

Obituary.

ALEXANDER JOHN ALLIOTT, M.D. CANTAB., M.R.C.S. ENG.

WE announce with regret the death of Dr. A. J. Alliott, which took place at his residence in Sevenoaks on Sept. 7th, a few months after the sudden appearance of obstructive jaundice, due to pancreatic disease of an undetermined nature. Born in 1847, he received his early education at Bedford Grammar School, and afterwards entered the University of Cambridge, where he obtained a scholarship at Pembroke College. In 1870 he graduated in arts, taking honours in the Natural Science Tripos. He commenced his medical studies at St. Thomas's Hospital and became a Member of the Royal College of Surgeons of England in 1872. In the following year he obtained the M.B. degree at Cambridge, proceeding in 1880 to the doctorate. After holding various appointments at St. Thomas's Hospital, at the Bethlem Royal Hospital, and at the Three Counties Lunatic Asylum, Bedfordshire, Dr. Alliott in 1875 commenced practice in Sevenoaks. His practice soon became an extensive one, and he gained considerable reputation in the field of psychological medicine. In the Children's Hospital for the Treatment of Hip Disease at Sevenoaks and in the local Cottage Hospital, at both of which institutions he was a member of the honorary staff, he took a special interest. The father of Dr. Alliott was the Rev. W. Alliott, of Howard Chapel, Bedford, a well-known minister who, at a time when the doors of the old universities were closed to Nonconformists, trained many candidates for the work of the London Missionary Society. Dr. Alliott possessed much of his father's love of this work and during the greater part of his professional career took an active part in the medical side of missionary life. Dr. Alliott retired from the active work of his profession in 1907, after 32 years' practice in Sevenoaks, when he received a handsome testimonial from a large number of friends and patients. He was much interested in all local affairs and in 1909 he was elected a member of the Sevenoaks urban council, of which body he was a regular attendant. Possessed of a highly sympathetic, even affectionate, nature, he will be greatly missed both by his professional friends and a wide circle of former patients. He leaves a widow who was his *alter ego* in the sympathetic and successful care of the many resident patients whom, some years ago, he was accustomed to receive.

An old and intimate friend of the late Dr. Alliott writes: "I was a fellow student of Dr. Alliott's and knew him intimately, from the time when he left Cambridge in 1870 to join at St. Thomas's Hospital Medical School, until his death. His active medical work during 32 years bore striking testimony to his own free choice of his profession. Whatever the nature might be of any case that came before him he never was in a hurry to come to a conclusion, but looked upon each patient, however simple the ailment might appear, as presenting a problem to be worked out to the best of his knowledge and ability. Before he settled in practice he had acquired much valuable experience in the diagnosis of mental disorders, and of this experience he made exceptionally fruitful use, not only in the treatment of large numbers of mental patients who were during many years sent to his private care, but also in the daily course of a busy general practice. I can recall but few medical men in any rank of the profession who equalled Alliott in both the desire and the ability to realise, so far as practicable, the total personality of the patients whose cases he was called upon to interpret and to treat. These qualities, coupled with extreme conscientiousness and minute attention to details, both of diagnosis and treatment, contributed largely to a success of the best kind in practice, and to the warm regard in which he was held by his patients—men, women, and children alike. With very special and practical knowledge of the workings of the human mind, he was in the true sense of the word an all-round general practitioner of the best order. It is given to few to work as he did without such a degree of anxiety and fatigue as makes itself felt by the worker; but, although he often suffered himself from these defects of his qualities it may truly be said that his patients were never the losers. They were always his first concern, and ever received his unwearying attention. Many must have missed him on the occasion of his well-earned retirement a few years ago, and all his old friends and fellow students will sorrow deeply for the loss of him."

BENJAMIN WAINEWRIGHT, M.B., M.CH. EDIN., F.R.C.S. ENG.

THE death has occurred at the age of 57 years of Mr. Benjamin Wainewright, at Pontresina, in Switzerland. Educated at the University of Edinburgh, where he took the degree of Bachelor of Medicine in 1880, he was senior resident surgeon at the Edinburgh Royal Infirmary and demonstrator of anatomy at the University of Edinburgh. He later qualified by examination as a Fellow of the Royal College of Surgeons of England, and coming to London began a career of great promise as an operating surgeon and ophthalmologist. His first appointment was an assistant surgeoncy at the West London Hospital, where he had for a time charge of the aural department; but on resigning this post he was elected assistant surgeon to the Charing Cross Hospital and to the Westminster Ophthalmic Hospital. He was at this time a keen member of several of the London medical societies, at times contributing to medical journals, and his chances of winning a high position in the medical profession were good. He had not, however, the usual incentives to labour hard at the medical profession. He liked operating and he liked teaching, but his private means allowed him to escape from all the drudgery of practice, and comparatively early in his professional career he virtually retired, resigning his hospital and teaching appointments, and confining his private and consulting practice to ophthalmic patients. Mr. Wainewright, who was a member of the Alpine Club, was an ardent mountain climber and was among the earliest frequenters of Pontresina, where he died, and where he was buried in accordance with his own expressed wish.

WILLIAM THOMAS LAW, M.D. EDIN., F.R.C.S. ENG.

Dr. W. T. Law, whose death occurred on Tuesday, Sept. 6th, at Bournemouth, was the son of the late Mr. Henry Compton Law, of Allington, by the daughter of the Rev. John Taylor, who was Chaplain in Ordinary to Queen Caroline, and in those easy-going days was a very much beneficed clergyman. He entered the medical school of Guy's Hospital in 1867, and later went to the University of Edinburgh and took his degree, after which he became resident physician to the Royal Infirmary, Edinburgh. Subsequently he came to London and became house physician at the Seamen's Hospital, Greenwich, and in 1875, while practising in Bury St. Edmunds, took the Fellowship of the Royal College of Surgeons of England.

Dr. Law was a very able and careful physician, and before his time in advocating the open-air treatment of phthisis. In 1902 he figured in a medical *cause célèbre* sustaining an action for negligence, in which £5000 were claimed from him. The suggestion was that his treatment of a case of asthma had conduced to the acquirement by the patient of a morphia habit. The jury stopped the case, giving Dr. Law the verdict with costs, but the costs were not forthcoming. Dr. Richard Paramore organised a fund to reimburse Dr. Law his expenses (see THE LANCET, May 24th, 1902) and a handsome sum, subscribed by the medical profession and the public, was presented to him on behalf of the donors by Sir William Church, who was the President of the Royal College of Physicians of London at the time.

Dr. Law, who was 65 years of age at the time of his death, succumbed to an operation for gall-stones. He leaves to mourn him his widow, the daughter of the late Judge Price, Q.C., his only son having predeceased him.

JAMES BROWN SIM, M.D. GLASG., L.R.C.S. EDIN.

BY the death of Dr. J. Brown Sim, which took place suddenly on August 31st, Nottingham has lost one of its best known medical practitioners. With one exception he was the oldest medical practitioner associated with the Poor-law in Nottingham. Dr. Sim was born at Stewarton, near Glasgow, in 1852, and received his medical education at the University of Glasgow. He became a Licentiate of the Royal College of Surgeons of Edinburgh in 1873, and in the same year graduated in medicine and

surgery at the University of Glasgow. After holding the positions of house surgeon at the Glasgow Royal Infirmary and at the Lock Hospital in that city, he commenced private practice in Nottingham and obtained the M.D. of his *alma mater* in 1876. In 1890 he was elected a member of the town council of Nottingham for the Manvers Ward and held his seat continuously till 1908. As a member of the council he served upon most of the important committees, and for nine years acted as the chairman of the Parliamentary committee. In 1900 he was elected as sheriff. As medical officer for the No. 3 District and public vaccinator for the North-East District of the Nottingham union he came into contact with a large number of the poor, by whom he was held in great esteem.

The death of Dr. Sim, who suffered from heart disease, was no doubt hastened by the sad death of his wife, to whom he was greatly devoted, which occurred a few months ago. He leaves a son, who follows his father's profession, and two daughters to mourn their loss.

DEATHS OF EMINENT FOREIGN MEDICAL MEN.—The deaths of the following eminent foreign medical men are announced: Dr. Hermann Schwartze of Halle, who had only very recently retired from the chair of otology, which he had held since its foundation some seven years ago. Previously to that he had practised and taught otology in Halle since 1863. He was one of the founders of modern German otological science, which he learned largely from the works of the English otologists, Toynbee and Wilde. He published many books and papers dealing with his specialty, and with Troeltsch and Politzer edited the *Archiv für Ohrenheilkunde*, which was founded in 1864.—Dr. Giuseppe Raineri, lecturer in midwifery in Turin.—Dr. Henoch, formerly professor extraordinary of pædiatry in Berlin.—Dr. Meinert, a distinguished gynæcologist and temperance advocate at Dresden, aged 63.—Dr. Friedrich Daniel von Recklinghausen, the distinguished Strasburg professor of pathological anatomy, aged 77. He was for some years assistant to Virchow in Berlin, and subsequently professor in Königsberg and Würzburg. When the University of Strasburg was reorganised after the war he was appointed to the chair of pathology there. His name will always be known in connexion with the discovery of the rôle of the leucocytes in inflammation and their identity with the white corpuscles of the blood. He also was the first to describe the phenomenon of phagocytosis. His chief works were: "The Lymphatics and their Relation to the Connective Tissue," Berlin, 1861; "Microphotographs of Pathological Preparations," Strasburg, 1878; "Multiple Fibromata of the Skin," Berlin, 1882; "Manual of the General Pathology of the Circulation," in Billroth and Luecke's German Surgery, 1883; and "Researches on Spina Bifida," Berlin, 1886.

SEVENTH INTERNATIONAL CONGRESS OF DERMATOLOGY AND SYPHILOGY.—This Congress is announced to take place in Rome from Sept. 25th to 29th, 1911. Its official title is VII. Congresso Internazionale di Dermatologia e Sifilografia. The President is Senatore, Professor Tommaso de Amicis of Naples (47, Via Medina), and the Secretary-General is Dr. Gaetano Ciarrocchi of Rome (5, Piazza Grazioli). The sixth congress took place at New York in 1907. Communications which are intended to be presented to the Congress should reach the Secretary-General not later than April 30th, 1911, and should be typewritten if possible The honorary presidents of the Congress are Mr. Jonathan Hutchinson of London, Dr. Edmund Lesser of Berlin, and Dr. James C. White of Boston. The Secretary for Great Britain and Ireland is Dr H. Adamson, 9, Weymouth-street, London, W. Those wishing to take part in the proceedings should communicate with the Secretary-General and fill up the "Bulletin d'Adhésion" which will be supplied and transmit the sum of 25 lire or 25 francs or £1 to the treasurer, Dr. Luigi Silvestri, 13, Via della Pace, Rome. The "Themes" to be considered are: "(1) The influence of the new etiological, diagnostical, and experimental researches on the therapeutics of syphilis, and on the possibility of immunisation, or of a radical or abortive treatment of the infection. (2) Results of physicotherapy in the diseases of the skin. (3) Blastomycosis, sporotrichosis, and analogous processes."

Medical News.

FOREIGN UNIVERSITY INTELLIGENCE.—*Basle:* Dr. F. de Quervain of La Chaux-de-Fonds has been appointed to the chair of Clinical Surgery in succession to Dr. Wilms who goes to Heidelberg.—*Berlin:* The title of Professor has been granted to Dr. G. von Bergmann and Dr. T. Brugsch, *privat-docenten* of Medicine.—*Bologna:* Dr. Giovanni Lüttichau and Dr. Matteo Selmi have been recognised as *privat-docenten* of Operative Medicine.—*Erlangen:* Dr. Robert Heinz has been appointed to the newly established Extraordinary Professoriat of Pharmacology.—*Freiburg:* Dr. H. K. Hegar has been appointed Extraordinary Professor of Gynæcology. The title of Extraordinary Professor has been granted to Dr. Edgar Gierke, *privat docent* of Pathological Anatomy; Dr. Hermann Schridde, *privat-docent* of General Pathology and Pathological Anatomy; Dr. Oswald Bumke, *privat docent* of Psychiatry; Dr. Otto Pankow, *privat-docent* of Midwifery and Gynæcology; and Dr. Emil Küster, *privat-docent* of Hygiene and Bacteriology.—*Genera:* Dr. Ernest Kummar, *privat-docent*, has been promoted to the chair of External Pathology and of Operative Medicine, in succession to Dr. Reverdin, resigned. Dr. Alfred Veyrassat has been appointed to the Polyclinical chair of Surgery.—*Genoa:* Dr. Pietro Baiardi has been appointed Extraordinary Professor of Ophthalmology. Dr. Giuseppe Mow has been recognised as *privat docent* of External Pathology. Dr. Federico Federici as *privat docent* of Otology and Laryngology, and Dr. Mario Chiò as *privat-docent* of Materia Medica and Experimental Pharmacology.—*Kazan:* Dr. N. A. Gerken has been appointed to the chair of Clinical Surgery.—*Kieff:* Dr. Dobromysloff of Tomsk has been appointed to the chair of Operative Medicine and Topographic Anatomy.—*Königsberg:* Dr. Leo Borchardt and Dr. Heinrich Lippmann have been recognised as *privat-docenten* of Medicine and Dr. Theodor Bürgers as *privat-docent* of Hygiene and Bacteriology.—*Lemberg:* Dr. Kasimir Orzechowski has been recognised as *privat docent* of Neurology.—*Messina:* Dr. Arturo Donaggio has been appointed Extraordinary Professor of Neurology and Psychiatry.—*Naples:* Dr Nicolò Rizzacasa has been recognised as *privat docent* of Midwifery and Gynæcology.—*Padua:* Dr. Edmondo Orlandi of Pavia has been recognised as *privat-docent* of Medicine.—*Palermo:* Dr. Domenico Massaro of Catania has been recognised as *privat docent* of Neurology and Psychiatry.—*Parma:* Dr. Andrea Majocchi and Dr. Salvatore Salinai have been recognised as *privat-docenten* of Surgery.—*Pavia:* Dr. Aldo Perroncito has been recognised as *privat docent* of Histology; Dr. Luigi Icilio Boni as *privat-docent* of Internal Pathology; Dr. Angelo Bellini as *privat-docent* of Dermatology; Dr. Luigi Bindo as *privat-docent* of Midwifery and Gynæcology; and Dr. Carlo Biaggi and Dr. Ottavio Lunghini as *privat docenten* of Otology and Laryngology.—*Strasburg:* Dr. Hans Vogt of Breslau has been recognised as *privat-docent* of Pædiatry.—*Vienna:* Dr. Emil Mattauschak has been recognised as *privat-docent* of Psychiatry.—*Zürich:* Dr. E. Feer of Heidelberg has been appointed Professor of Pædiatry in succession to Dr. Wyss, resigned.

THE BRITISH HOSPITALS ASSOCIATION.—The first annual conference of this association will be held in the University Buildings, Glasgow, on Sept. 29th and 30th. On Sept. 29th, at 10 A.M., the Hon. the Lord Provost A. McInnes Shaw will deliver an address of welcome, which will be followed by two papers, the one on "The Majority Point of View on the Poor-law as regards General and Special Hospitals," by Mr. Charles Stewart Loch, B.A., and the other on "The Abuse of the Hospital and its Cure," by Mr. A. Scott Finnie. The reading of these papers will be followed by discussions. On Sept. 30th Mrs. Sidney Webb will open a discussion on "A Unified County Medical Service and How it will Affect the Voluntary Hospital," and Dr. Nathan Raw will open a discussion on "The Institutional Treatment of Tuberculosis." The president of the association is Mr. H. Cosmo Bonsor, the treasurer of Guy's Hospital, London. The honorary treasurer is Mr. Conrad W. Thies, Royal Free Hospital, London. The honorary secretaries are Mr. A. William West, 3A, Lyall-street, Belgrave-square, London, S.W., and Dr. D. J.

Mackintosh, M.V.O., Western Infirmary, Glasgow. The objects of the association are defined as (1) to facilitate the consideration and discussion of matters connected with hospital management, and, where advisable, to take measures to further the decisions arrived at; and (2) to afford opportunities for the acquisition of a knowledge of hospital administration, both lay and medical. Active members are those who at the time of their election are trustees, members of committee, or executive or professional heads of hospitals, without reference to sex or title. The annual subscription is half a guinea. Honorary members are exempt from the payment of an annual subscription.

CEREBRO-SPINAL MENINGITIS.—After the lapse of nearly three weeks, a recrudescence of cerebro-spinal meningitis is reported. A fatal case occurred at Nottingham last week, and the occurrence of a case at Long Clawson and another at Welby indicates that Leicestershire is not yet free. The disease has arisen in Essex, two cases having been reported at Sandon, near Chelmsford, a severe case which terminated fatally within 48 hours of the onset and a mild case. In addition, a case has been admitted into the Metropolitan Asylums Board Eastern Hospital from Bethnal Green.

Professor Reinhold Ruge, naval surgeon-general and *privat-docent* of the History and Geography of Pathology in the University of Kiel, has been entrusted by the German Government with the oversight of the arrangements for medical study by naval surgeons.

BOOKS, ETC., RECEIVED.

ALLENSON, H. R., LIMITED, 7, Racquet-court, Fleet-street, London, E.C.
The Faith of an Evolutionist. By Theobald A. Palm, M.A., M.D. Price 2*s.* 6*d.* net.

BAILLIÈRE, TINDALL, AND COX, London.
Medical Supervision in Schools. Being an Account of the Systems at Work in Great Britain, Canada, the United States, Germany, and Switzerland. By Edward Millar Steven, M.B., Ch.M. (Edinburgh), Royal Commissioner for South Australia, 1909. Price 5*s.* net.
Military Hygiene. By Robert Caldwell, F.R.C.S., D.P.H., Lieut.-Colonel, R.A.M.C. Second edition. Price 12*s.* 6*d.* net.
Physiological Principles in Treatment. By W. Langdon Brown, M.A., M.D. Cantab., F.R.C.P. Second edition. Price 5*s.* net.

BALE (JOHN), SONS, AND DANIELSSON, LIMITED, London.
Amœbic or Tropical Dysentery, its Complications and Treatment. By W. Carnegie Brown, M.D., M.R.C.P. Price 7*s.* 6*d.* net.

CHURCHILL, J. AND A., London.
A Manual on Dental Metallurgy. By Ernest A. Smith, Associate of the Royal School of Mines, London, Member of the Institute of Mining and Metallurgy, the Institute of Metals, and of the Society of Chemical Industry. Third edition. Price 6*s.* 6*d.* net.

HARE PHARMACY, THE, 38, Amherst-street, Calcutta.
Outlines of Medical Jurisprudence and Treatment of Poisoning. For Students and Practitioners. By Rames Chandra Ray. Price 2 rupees.

HIRSCHWALD, AUGUST, Berlin.
Gedanken zur allgemeinen Energetik der Organismen. Von Carl Lüderitz. Price M.1.20.

KARGER, S., Berlin.
Jahrbuch für Kinderheilkunde und Physische Erziehung. Unter Redaktion von O. Heubner, Th. Escherich, A. Czerny. 72, der dritten Folge. 22 Band. Heft 3. Ausgegeben am 1 September.

KEGAN PAUL, TRENCH, TRÜBNER, AND CO., LIMITED, London.
The International Scientific Series. Edited by F. Legge. The Evolution and Function of Living Purposive Matter. By N. C. Macnamara, F.R.C.S. Price 5*s.*
The Abuse of the Singing and Speaking Voice. Causes, Effects, and Treatment. By E. J. Moure and A. Bouyer Fils. Translated by Macleod Yearsley, F.R.C.S. Price 2*s.* 6*d.* net.
Argentina, Past and Present. By W. H. Koebel. Price 12*s.* 6*d.* net.
The Vision of the Young Man Menelaus. Studies of Pentecost and Easter. By the author of "Resurrectio Christi." Price 2*s.* 6*d.* net.

LAURIE, T. WERNER, Clifford's Inn, London.
Old Continental Towns. By Walter M. Gallichan. Price 6*s.* net.

LIPPINCOTT (J. B.) COMPANY, Philadelphia and London.
Lippincott's New Medical Dictionary. By Henry W. Cattell, A.M. (Lat.), M.D. (U. of P.). Price 21*s.* net.

LONGMANS, GREEN, AND CO., London, New York, Bombay, and Calcutta.
An Introduction to Biology. For Students in India. By R. E. Lloyd, M.B., D.Sc. Lond., Indian Medical Service. Price 4 rupees, or 5*s.* 4*d.*

MARHOLD, CARL, Halle-a.-S.
Die Gicht und ihre diätetische Therapie. Von Prof. Dr. A. Schittenhelm, Erlangen, und Privatdozent Dr. J. Schmid, Breslau. Price M.1.

MARLBOROUGH, E., AND CO., London.
Finnish Self-Taught (Thimm's System). With Phonetic Pronunciation. By Agnes Renfors. Price, wrapper, 2*s.*; cloth, 2*s.* 6*d.*

MILLS, DICK, AND CO., Printers, Octagon, Dunedin.
Feeding and Care of Baby. Issued by the Society for the Health of Women and Children. Price 1*s.*

OUSELEY, JOHN, LIMITED, Fleet-lane, Farringdon-street, London, E.C., and at Dublin and Melbourne.
Legally Dead. Experiences during Seventeen Weeks' Detention in a Private Asylum. By Marcia Hamilcar. Price 5*s.* net.

PHARMACEUTICAL PRESS, THE, 72, Great Russell-street, London, W.C.
How to Become a Pharmacist in Great Britain. With Appendixes on Pharmaceutical Qualification in Ireland, Degrees in Pharmacy, and the Schedule of Poisons. Edited by John Humphrey. Price 1*s.*

POOR-LAW PUBLICATIONS COMPANY, 18 and 19, Whitefriars-street, London, E.C.
The Law relating to Pauper Lunatics. By Sydney Davey, B.A., LL.B. Of the Middle Temple, Barrister-at-Law. Second edition. Price not stated.

REBMAN, LIMITED, London.
The Mental Symptoms of Brain Disease. By Bernard Hollander, M.D. With Preface by Dr. Jul. Morel, late Belgian State Commissioner in Lunacy. Price 6*s.* net.
Phases of Evolution and Heredity. By David Berry Hart, M.D., F.R.C.P.E. Price 5*s.* net.
Diagnostic Therapeutics. A Guide for Practitioners in Diagnosis by Aid of Drugs and Methods other than Drug-giving. By Albert Abrams, A.M., M.D. (Heidelberg). Price 21*s.* net.
The Diseases of the Nose, Mouth, Pharynx, and Larynx. A Textbook for Students and Practitioners of Medicine. By Dr. Alfred Bruck (Berlin). Edited and translated by F. W. Forbes Ross, M.D. Edin., F.R.C.S. Eng., assisted by Friedrich Gans, M.D. Price 21*s.* net, cloth.
Anæmia. By Geh. Obermedizinalrat Professor Dr. P. Ehrlich and Dr. A. Lazarus. Part I. Volume I. Normal and Pathological Histology of the Blood. Second edition. (Enlarged and to a great extent rewritten.) By Dr. A. Lazarus and Dr. O. Naegeli. Translated from the German by H. W. Armit, M.R.C.S., L.R.C.P. Lond. Price 12*s.* 6*d.* net, cloth.
Clinical Treatises on the Pathology and Therapy of Disorders of Metabolism and Nutrition. By Prof. Dr. Carl von Noorden. Part VIII. Inanition and Fattening Cures. Price 5*s.* net, cloth. Part IX. Technique of Reduction Cures and Gout. Price 5*s.* net, cloth. Edited and translated under the supervision of Alfred C. Croftan, M.D, Chicago, U.S.A.
Hints for the General Practitioner in Rhinology and Laryngology. By Dr. Johann Fein. Translated by J. Bowring Horgan, M.B., B.Ch. Price 5*s.* net, cloth.
The Sexual Life of Woman in its Physiological, Pathological, and Hygienic Aspects. By E. Heinrich Kisch, M.D. Only authorised translation into the English language from the German, by M. Eden Paul, M.D. Price 21*s.* net.

SOUTHERN SURGICAL AND GYNECOLOGICAL ASSOCIATION (Secretary: Dr. William D. Haggard, Nashville, Tennessee, U.S.A.).
Transactions of the Southern Surgical and Gynecological Association. Vol. XXII. Twenty-second Session held at Hot Springs, Va., Dec. 14th, 15th, and 16th, 1909. Edited by W. D. Haggard, M.D. Price not stated.

STANFORD, EDWARD, London.
British Rainfall, 1909. On the Distribution of Rain in Space and Time over the British Isles during the year 1909, as recorded by more than 4500 Observers in Great Britain and Ireland. By Hugh Robert Mill. Forty-ninth Annual Volume. Price 10*s.*

VIGOT FRÈRES, Paris.
Les Formes Larvées du Paludisme. Diagnostic et Traitement. Par le Dr. Basile Mousséos. Price Fr.3.50.
Clinique Thérapeutique de la Faculté de Médecine de Paris. Hôpital Beaujon. Thérapeutique Usuelle du Praticien. Par Albert Robin, Professeur de Clinique Thérapeutique à la Faculté de Médecine de Paris. Price Fr.8.
Morphinisme et Morphinomanie. Les Différentes Méthodes de Sevrage sans Souffrance. Par le Dr. Oscar Jennings. Traduit de l'Anglais avec une Introduction par le Dr. Henri Mignon. Price Fr.2.50.

WILEY, JOHN, AND SONS, New York. CHAPMAN AND HALL, LIMITED, London.
The Sources and Modes of Infection. By Charles V. Chapin, M.D., Sc.D. First Edition. First thousand. Price, cloth, $3.00 net, or 12*s.* 6*d.* net.
A Text-book of Organic Chemistry. By A. F. Holleman, Ph.D., F.R.A. Amst. Edited by A. Jamieson Walker, Ph.D. (Heidelberg), B.A. Assisted by Owen E. Mott, Ph D. (Heidelberg). With the coöperation of the Author. Third English Edition, partly rewritten. First thousand. Price $2.50.

Appointments.

Successful applicants for Vacancies, Secretaries of Public Institutions, and others possessing information suitable for this column, are invited to forward to THE LANCET *Office, directed to the Sub-Editor, not later than 9 o'clock on the Thursday morning of each week, such information for gratuitous publication.*

BRODRICK, C. C., L.R.C.P. Edin., has been re-appointed Medical Officer of Health of Tavistock, Devon.

CLARIDGE, G. P. C., M.B., B.S. Lond., has been appointed Honorary Pathologist and Bacteriologist to the Norfolk and Norwich Hospital.

CORBETT, W. VICTOR, M.R.C.S., L.R.C.P. Lond., has been appointed Senior Ophthalmic House Surgeon at St. Thomas's Hospital.

DYKES, C. R., L.R.C.P. Lond., M.R.C.S. Eng., has been appointed Certifying Surgeon under the Factory and Workshop Act for the Loughton District of the county of Essex.

FLOYD, S. F., M.B., B.S. R.U.I., has been appointed Certifying Surgeon under the Factory and Workshop Act for the Kilkeel District of the county of Down.

HOFFMANN, G., M.R.C.S., L.R.C.P. Lond., has been appointed a Resident House Surgeon at St. Thomas's Hospital.

LUPTON, J. P., M.R.C.S., L.R.C.P. Lond., has been appointed Junior Ophthalmic House Surgeon at St. Thomas's Hospital.

MCCORMAC, W. L., M.B., B.S. Vict., F.R.C.S. Edin., has been appointed Medical Superintendent of the Wandsworth Infirmary.

MEAKIN, L., B.C. Cantab., M.R.C.S., L.R.C.P. Lond., has been appointed a Resident House Surgeon at St. Thomas's Hospital.

MILNE, F. M., M.B., B.S. St. And., has been appointed Assistant Physician to the Dundee Royal Infirmary.

MORCOM, A. F., M.R.C.S., L.R.C.P. Lond., has been appointed a House Surgeon at St. Thomas's Hospital.

MUGLISTON, H. B., L.R.C.P. Edin., has been appointed Medical Officer for the Brent Knoll District by the Axbridge (Somerset) Board of Guardians.

NOLAN, JOSEPH J., L.R.C.P. Irel., L.K.Q.C.P. Irel., has been appointed a Medical Referee under the Workmen's Compensation Act, 1906, to act for County Carlow, Ireland.

PERRY, L. B., M.B., B.C. Cantab., M.R.C.S., L.R.C.P. Lond., has been appointed an Obstetric House Physician at St. Thomas's Hospital.

PINK, W. L., M.B., B.S. Lond., M.R.C.S., L.R.C.P. Lond., has been appointed a Resident House Surgeon at St. Thomas's Hospital.

RICHARDSON, A. H., M.R.C.S., L.R.C.P. Lond., has been appointed a Resident House Surgeon at St. Thomas's Hospital.

WELCH, H. V., M.R.C.S., L.R.C.P. Lond., has been appointed a Clinical Assistant in the Throat Department and in the Children's Surgical Department at St. Thomas's Hospital.

WILSON, H. B., M.R.C.S., L.R.C.P. Lond., has been appointed an Obstetric House Physician at St. Thomas's Hospital.

WRIGLEY, P. R., F.R.C.S. Eng., has been appointed Honorary Assistant Surgeon to the Manchester Royal Infirmary.

Vacancies.

For further information regarding each vacancy reference should be made to the advertisement (see Index).

BARROW-IN-FURNESS WORKHOUSE, COTTAGE HOMES, AND DISTRICT.—Medical Officer. Salary £200 per annum.

BEDFORD COUNTY HOSPITAL.—House Physician. Salary £60 per annum, with apartments, board, and washing.

BETHNAL GREEN INFIRMARY, Cambridge Heath, E.—Assistant Medical Officer. Salary at rate of £100 per annum, with apartments, board, and washing.

BIRKENHEAD BOROUGH HOSPITAL.—Junior Resident House Surgeon. Salary £80 per annum.

BRIGHTON AND HOVE HOSPITAL FOR WOMEN.—House Surgeon, unmarried, for six months. Salary £80 per annum, with apartments, board, &c.

BRISTOL GENERAL HOSPITAL.—House Physician, House Surgeon, Casualty House Surgeon, and Assistant House Physician, all for six months. Salary £60, with board, residence, &c.

BURY ST. EDMUNDS, WEST SUFFOLK GENERAL HOSPITAL.—House Surgeon, unmarried. Salary £100 per annum, with board, lodging, and washing.

CANCER HOSPITAL, Fulham-road, London, S.W.—Assistant Surgeon.

CARLISLE, CUMBERLAND AND WESTMORLAND ASYLUM.—Junior Assistant Medical Officer, unmarried. Salary £130 per annum, with board and lodging.

CHELTENHAM GENERAL HOSPITAL.—House Physician, unmarried. Salary £75 per annum, with board and lodging. Also Surgeon-in-Charge, unmarried, of Branch Dispensary. Salary £80 per annum, with board and lodging.

CHESTERFIELD AND NORTH DERBYSHIRE HOSPITAL.—House Physician. Salary £60 per annum, with board, apartments, and laundry.

DEVONPORT, ROYAL ALBERT HOSPITAL.—Resident Medical Officer, unmarried. Salary £100 per annum, with apartments, board, laundry, &c.

DREADNOUGHT HOSPITAL, Greenwich.—Two House Physicians, also Two House Surgeons, for six months. Salary in each case £50 per annum, with board, residence, and washing. Also Assistant Surgeon.

DUNDEE SCHOOL BOARD.—Assistant Medical Officer. Salary £250 per annum.

EVELINA HOSPITAL FOR SICK CHILDREN, Southwark Bridge-road, S.E.—House Surgeon. Salary at rate of £60 per annum, with board, residence, and washing. Also about Ten Clinical Assistants.

FULHAM INFIRMARY, St. Dunstan's-road, Hammersmith, W.—Junior Assistant Medical Officer for six months. Salary at rate of £100 per annum, with board, apartments, and washing.

GLASGOW MATERNITY AND WOMEN'S HOSPITAL.—Two Indoor House Surgeons for six months. Salary at rate of £50 per annum. Two Outdoor House Surgeons, and Female Outdoor House Surgeon, each for three months. Salary at rate of £72 per annum.

GREAT NORTHERN CENTRAL HOSPITAL, Holloway-road, N.—Physician. Also Two House Physicians and Three House Surgeons, each for six months. Salary at rate of £40 per annum, with board, lodging, and laundry.

HALIFAX, ROYAL INFIRMARY.—Third House Surgeon, unmarried. Salary £80 per annum, with residence, board, and washing.

HASTINGS, ST. LEONARDS, AND EAST SUSSEX HOSPITAL, Hastings.—Assistant House Surgeon for six months. Salary £20, with rooms, board, and washing.

JERSEY INFIRMARY AND DISPENSARY.—Resident Medical Officer, unmarried. Salary £100 per annum, with board, lodging, and attendance.

LANCASTER ROYAL INFIRMARY.—House Surgeon, unmarried. Salary £100 per annum, with residence, board, &c.

LEICESTER INFIRMARY.—House Physician. Salary at rate of £100 per annum, with board, lodging, and washing.

LIVERPOOL, BROWNLOW HILL WORKHOUSE.—Visiting Surgeon. Salary £200 per annum.

LIVERPOOL, CITY OF.—Assistant to the Medical Officer of Health. Salary £250 per annum.

LIVERPOOL DISPENSARIES.—Assistant Surgeon, unmarried. Salary £100 per annum, with board and apartments.

LOCHGILPHEAD, ARGYLE AND BUTE ASYLUM.—Assistant Medical Officer, unmarried. Salary £160 per annum, with board, apartments, and laundry.

LONDON HOSPITAL, Whitechapel, E.—Two Surgical Registrars. Salary £100 per annum each.

LONDON TEMPERANCE HOSPITAL.—Surgical Registrar. Salary at rate of 40 guineas per annum.

LOWESTOFT HOSPITAL.—House Surgeon, unmarried. Salary at rate of £100 per annum, with board, lodging, and washing.

MANCHESTER ROYAL INFIRMARY.—Assistant Surgical Officer. Salary £35 per annum. Also Medical Officer for six months. Salary at rate of £100 per annum, with board and residence.

MIDDLESBROUGH, NORTH RIDING INFIRMARY.—Assistant House Surgeon. Salary £75 per annum, with residence, board, and washing.

NATIONAL HOSPITAL FOR THE PARALYSED AND EPILEPTIC.—Clinical Pathologist. Salary £50 per annum.

NEW HOSPITAL FOR WOMEN, Euston-road, N.W.—Senior Assistant for X Ray Department; also Clinical Assistants (all females).

NEWCASTLE-UPON-TYNE, ROYAL VICTORIA INFIRMARY.—Medical and Surgical Registrars.

PLYMOUTH, SOUTH DEVON AND EAST CORNWALL HOSPITAL.—House Physician for six months. Salary £75 per annum, with board, residence, and washing.

QUEEN CHARLOTTE'S LYING-IN HOSPITAL, Marylebone-road, N.W.—Resident Medical Officer for Out-patient Department for four months. Salary at rate of £60 per annum, with board, residence, and washing.

ROYAL DENTAL HOSPITAL OF LONDON, Leicester-square.—Joint Morning House Anæsthetist. Salary £25 per annum.

ROYAL HOSPITAL FOR DISEASES OF THE CHEST, City-road, E.C.—House Physician for six months. Salary at rate of £60 per annum, with board, lodging, and washing.

ROYAL LONDON OPHTHALMIC HOSPITAL, City-road, E.C.—Senior House Surgeon. Salary at rate of £100 per annum, with board and residence.

ROYAL NAVAL MEDICAL SERVICE.—Fifteen Commissions.

ST. PETER'S HOSPITAL FOR STONE, &c., Henrietta-street, Covent Garden, W.C.—Junior House Surgeon for six months. Salary at rate of £50 per annum, with board, lodging, and washing.

SALFORD ROYAL HOSPITAL.—Junior House Surgeon for six months. Salary at rate of £50 per annum, with board and residence.

SAMARITAN FREE HOSPITAL FOR WOMEN, Marylebone-road, N.W.—Clinical Assistants.

SHEFFIELD ROYAL HOSPITAL.—Assistant House Physician, unmarried. Salary £50 per annum, with board, lodging, and washing.

THROAT HOSPITAL, Golden-square, W.—Honorary Anæsthetist.

VENTNOR, ROYAL NATIONAL HOSPITAL FOR CONSUMPTION.—Assistant Resident Medical Officer, unmarried, for six months. Salary £100 per annum, with board, lodging, and washing.

WAKEFIELD, WEST RIDING ASYLUM.—Locum Tenens. Salary £3 3s. per week, with apartments and board.

WEST LONDON HOSPITAL AND POST-GRADUATE COLLEGE, Hammersmith-road, W.—Clinical Assistants. Also Three Non-Resident Assistant House Surgeons, each for three months.

WOMEN'S IMPERIAL HEALTH ASSOCIATION.—Lecturer (female). Salary at rate of £150 per annum and expenses.

THE Secretary of State for the Home Department gives notice of a vacancy for a Medical Referee under the Workmen's Compensation Act, 1906, for County Court Circuit No. 43, more particularly to the Brompton and Marylebone County Courts.

THE Chief Inspector of Factories, Home Office, London, S.W., gives notice of vacancies for Certifying Surgeons under the Factory and Workshop Act at Pwllheli, in the county of Carnarvon; at Wadebridge, in the county of Cornwall; and at Harrold, in the county of Bedford.

Births, Marriages, and Deaths

BIRTHS.

HANDLEY.—On Sept. 10th, at 12, New Cavendish-street, W., to Mr. and Mrs. W. Sampson Handley, a son.

HUBERT.—On Sept. 10th, at "Rosehill," Billingshurst, Sussex, the wife of W. A. Hubert, M.R.C.S. Eng., L.S.A. Lond., of a daughter.

JOY.—On Sept. 6th, at Craven-road, Harlesden, N.W., to Dr. and Mrs. G. P. Joy, a daughter.

KEMPTHORNE.—On Sept. 2nd or 3rd, at Dalhousie, India, the wife of Captain G. A. Kempthorne, R.A.M.C., of a son.

WILBERFORCE SMITH.—On Sept. 5th, at West End avenue, Pinner, Alsie, wife of D. Wilberforce Smith, M.B., B.S., of a son.

MARRIAGES.

GRAHAM-SMITH—LEITH-ROSS.—On Sept. 8th, at St. Mary's on the Rock, Ellon, Aberdeenshire, G. S. Graham-Smith, M.A., M.D. Cantab., to Violet, only daughter of Colonel Leith-Ross, of Arnage, Aberdeenshire.

DEATHS.

JACK.—On Sept. 8th, at Campden Hill-road, Kensington, Deputy-Inspector-General John Jack, R.N., aged 92 years.

LAW.—On Sept. 6th, at Bournemouth, after an operation, William Thomas Law, M.D., F.R.C.S., aged 65 years.

N.B.—A fee of 5s. is charged for the Insertion of Notices of Births, Marriages, and Deaths.

Notes, Short Comments, and Answers to Correspondents.

DIFFICULT ENGLISH.

Dr. Webb Anderson, Fatshan Hospital, Wesleyan Mission, Canton, China, sends us the following extract from a letter which accompanied a patient sent to him suffering from phthisis. The writer, the patient's husband, has been a scholar in a well-known college in Hong-Kong, and, as is the fashion, sends the physician instructions to heal this or that ailment first, leaving other matters until later. The patient's husband wrote the following account:—

> She felt a little pains last night and the cough scarcely subtract the same to the precedent. Some pains feel this morning in the parts of the stomach and the ribs of the right hand. And feel thirsty not very much.
>
> Now I wish to be cured with the important thing as following:—
>
> 1. Render her most appetite
> 2. Take care the moisture.

"Scarcely subtract the same to the precedent" is a phrase requiring explanation, the rest of the instruction being more or less intelligible. "The precedent" is the previous day's experience and "scarcely subtract" is intended to have the force of "hardly diminished." But for the stolidity of his Oriental neighbours the Englishman's Chinese might be the source of equal merriment to them, but it is usually observed that the Oriental does not smile at a foreigner's attempts, grotesque as they often must be, to overcome the difficulties intricate idiom. This courtesy is not due to good manners, we fear, so much as to his inability to appreciate the humour of our errors; and herein is the Oriental strictly differentiated from the European.

89 YEARS A PAUPER.

THE remarkable case of a woman's whole life being spent in poorhouse and workhouse was mentioned at a meeting of the Eastbourne guardians on Sept. 9th. The master reported the death of Jane Avery, who had been an inmate of Eastbourne workhouse and the poorhouse before that for 89 years—in fact, she had been under the care of the guardians since she was 4 days old. She was mentally deficient. It was stated at the board meeting that the woman had cost the ratepayers roughly £1600.

E. MERCK'S ANNUAL REPORT.

THE publication of this annual report is always welcome, since it records with some detail the advances in pharmaceutical chemistry and therapeutics of the current year. The present issue (Vol. XXIII.) contains an unusually interesting series of monographs, and no less than 84 pages are devoted to serum-therapy and bacterio-therapeutic preparations. The references to periodical literature are quite recent, and we note that in some cases analytical methods which are an advance on previous methods, especially in connexion with the examination of pathological products, are recorded. We have found these annual reports most useful for reference, and although, of course, there is a commercial side to their publication, there is no trace of partiality through the pages on the part of the great firm who issue the reports. We understand that a limited number of copies of the present issue, which comprises 347 pages of literary matter, will be sent free to medical men on application to 16, Jewry-street, London, E.C.

DRAPERY ESTABLISHMENTS AND PRECAUTIONS AGAINST THE RISKS OF FIRE.

THERE is something to be said both for and against the system of "living in" at large drapery establishments, but many terrible catastrophes from fire point to the necessity that where "living in" is the rule precautions must be taken of the most rigid sort against all danger to the employees from an outbreak of fire. It is reported that for the third time within a month a fire has occurred at a draper's shop at Brixton, and on the third occasion—namely, on Sept. 11th—a female assistant was killed by jumping from a window. This unfortunately fatal outbreak took place in the early hours of the morning, and before a fire-escape could be placed in position three of the distracted girls had jumped from the upper storeys of the building. Two of the young women fell into a tarpaulin held by people in the street, but one misjudged her distance and fell on the pavement. She died on the way to the hospital; the other two are in St. Thomas's Hospital still undergoing treatment. It is probable that had the girls waited till the fire-escape arrived they could all easily have been saved, but to be philosophically collected when shut up in a burning building is difficult, and it would be indeed strange if out of a crowd of young women awakened from sleep after the harassing work of a long day in a shop some did not lose their nerve in such circumstances. Employees in any business where inflammable goods are stored should not be compelled to sleep in the building, and more effective legislation is required to protect employees and others from the danger of fire. This danger is an ever-present one, but with the advent of Christmas it becomes even more pronounced in drapery establishments, where the rivalry of trade encourages the accumulation of inflammable goods and decorations which are a source of great danger not only to the employees but to the general public. The recollection of the catastrophe which occurred at Clapham last Christmas is present in our minds as we write these words.

ERRATUM.—In the report of the proceedings of the British Medical Association in our issue of Sept. 10th we ascribed certain remarks made by Mr. Barker Smith before the Section of State Medicine to Dr. Parker Smith. We regret the slip.

COMMUNICATIONS not noticed in our present issue will receive attention in our next.

A DIARY OF CONGRESSES.

THE following Congresses, Conferences, and Exhibitions are announced for 1910:—

Sept. 17th–25th (Antwerp).—Fourteenth Flemish Congress of Natural and Medical Sciences and International Scientific Exhibition.
" 18th–24th (Königsberg).—Eighty-second Congress of German Scientists and Medical Men.
" 22nd–27th (Toulouse).—Sixth French Congress of Gynæcology, Obstetrics, and Pædiatrics.
" 22nd–28th (St. Petersburg).—Fifth International Congress of Obstetrics and Gynæcology.
" 27th–30th (Vienna).—Eighth International Physiological Congress.
" 29th and 30th (Glasgow).—First Annual Conference of the British Hospitals Association.
Oct. 1st–5th (Paris).—Second International Conference for the Study of Cancer.
" 3rd–7th (London).—Sixth London Medical Exhibition.
" 3rd–7th (Berlin).—International Congress on the Care of the Insane.
" 4th–8th (Brussels).—Second International Congress of Alimentary Hygiene.
" 5th–8th (Brussels).—Ninth International Tuberculosis Conference.
" 10th–15th (London).—Town Planning Conference.
" 13th–15th (Paris).—Eleventh French Congress of Medicine.
" 16th–22nd (Barcelona).—First International Spanish Congress of Tuberculosis.
Nov. 7th–12th (Cape Town).—Twelfth South African Medical Congress (1910).

In 1911:—
May–October (Dresden).—International Hygiene Exhibition.
June and July (Romford).—Town Planning and Modern House and Cottage Exhibition.
July (Birmingham).—British Medical Association.
August or September (Berlin).—Third International Laryngo-Rhinological Congress.
September Brussels).—Exhibition of Fractures.
Sept. 24th–30th (Rome).—International Congress on Tuberculosis.
" 25th–29th (Rome) Seventh International Congress of Dermatology and Syphilology.
October (Cologne).—International Congress of Criminal Anthropology.

In 1912:—
September (Washington, D.C.).—Fifteenth International Congress of Hygiene and Demography.

In 1913 the only fixture so far is in London, where the Seventeenth International Congress of Medicine will take place.

Medical Diary for the ensuing Week.

LECTURES, ADDRESSES, DEMONSTRATIONS, &c.

MEDICAL GRADUATES' COLLEGE AND POLYCLINIC, 22, Chenies-street, W.C.

MONDAY.—4 P.M., Dr. S. E. Dore: Clinique (Skin).
TUESDAY.—4 P.M., Dr. T Thompson: Clinique (Medical).
WEDNESDAY.—4 P.M, Mr. L. Mummery: Clinique (Surgical).
THURSDAY.—4 P.M., Mr. R P. Rowlands: Clinique (Surgical).
FRIDAY.—4 P.M., Mr. Harold Barwell: Clinique (Ear, Nose and Throat).

POST-GRADUATE COLLEGE, West London Hospital, Hammersmith-road, W.

MONDAY.—2 P.M., Medical and Surgical Clinics. X Rays. Operations. 2.30 P.M., Mr. Dunn: Diseases of the Eye.
TUESDAY.—10 A.M., Dr. Robinson: Gynæcological Operations. 2 P.M., Medical and Surgical Clinics. X Rays. Operations. Dr. Davis: Diseases of the Throat, Nose, and Ear. 2.30 P.M., Dr. Abraham: Diseases of the Skin.
WEDNESDAY.—10 A.M., Dr. Saunders: Diseases of Children Dr. Davis: Operations of the Throat, Nose, and Ear. 2 P.M., Medical and Surgical Clinics X Rays. Operations. Mr. B. Harman Diseases of the Eye. 2.30 P.M., Dr. Robinson: Diseases of Women.
THURSDAY.—2 P.M., Medical and Surgical Clinics. X Rays. Operations. Mr. Dunn: Diseases of the Eye.
FRIDAY.—10 A.M., Dr. Robinson: Gynæcological Operations 2 P.M., Medical and Surgical Clinics. X Rays. Operations. Dr. Davis: Diseases of the Throat, Nose, and Ear. 2.30 P.M., Dr. Abraham: Diseases of the Skin
SATURDAY.—10 A.M., Dr. Saunders: Diseases of Children. Dr. Davis: Operations of the Throat, Nose, and Ear. Mr. B Harman: Diseases of the Eye. 2 P.M., Medical and Surgical Clinics. X Rays. Operations.

LONDON HOSPITAL MEDICAL COLLEGE (UNIVERSITY OF LONDON), Clinical Theatre, London Hospital, Mile End-road, E.

MONDAY.—2 P.M., Clinical Demonstration: Dr. Wall: Diseases of the Lungs.

TUESDAY.—2 P.M., Clinical Demonstration: Dr. Grünbaum: Diseases of the Kidneys.

WEDNESDAY.—2 P.M., Clinical Demonstration: Dr. Hutchison: Diseases of the Digestive System and Children's Diseases

THURSDAY.—2 P.M., Clinical Demonstration: Dr. T. Thompson: Diseases of the Nervous System.

FRIDAY.—2 P.M., Clinical Demonstration: Dr. L. Smith: Diseases of the Heart and Vessels.

OPERATIONS.

METROPOLITAN HOSPITALS.

MONDAY (19th).—London (2 P.M.), St. Bartholomew's (1.30 P.M.), St. Thomas's (3.30 P.M.), St. George's (2 P.M.), St. Mary's (2.30 P.M.), Middlesex (1.30 P.M.), Westminster (2 P.M.), Chelsea (2 P.M.), Samaritan (Gynæcological, by Physicians, 2 P.M.), Soho-square (2 P.M.), City Orthopædic (4 P.M.), Gt. Northern Central (2.30 P.M.), West London (2.30 P.M.), London Throat (9.30 A.M.), Royal Free (2 P.M.), Guy's (1.30 P.M.), Children, Gt. Ormond-street (9 A.M.), St. Mark's (2.30 P.M.), Central London Throat and Ear (Minor 9 A.M., Major 2 P.M.),

TUESDAY (20th).—London (2 P.M.), St. Bartholomew's (1.30 P.M.), St. Thomas's (3.30 P.M.), Guy's (1.30 P.M.), Middlesex (1.30 P.M.), Westminster (2 P.M.), West London (2.30 P.M.), University College (2 P.M.), St. George's (1 P.M.), St. Mary's (1 P.M.), St. Mark's (2.30 P.M.), Cancer (2 P.M.), Metropolitan (2.30 P.M.), London Throat (9.30 A.M.), Samaritan (9.30 A.M. and 2.30 P.M.), Throat, Golden-square (9.30 A.M.), Soho-square (2 P.M.), Chelsea (2 P.M.), Children, Gt. Ormond-street (9 A.M. and 2 P.M., Ophthalmic, 2 P.M.), Tottenham (2.30 P.M.), Central London Throat and Ear (Minor, 9 A.M., Major, 2 P.M.).

WEDNESDAY (21st).—St. Bartholomew's (1.30 P.M.), University College (2 P.M.), Royal Free (2 P.M.), Middlesex (1.30 P.M.), Charing Cross (3 P.M.), St. Thomas's (2 P.M.), London (2 P.M.), King's College (2 P.M.), St. George's (Ophthalmic, 1 P.M.), St. Mary's (2 P.M.), National Orthopædic (10 A.M.), St. Peter's (2 P.M.), Samaritan (9.30 A.M. and 2.30 P.M.), Gt. Northern Central (2.30 P.M.), Westminster (2 P.M.), Metropolitan (2.30 P.M.), London Throat (9.30 A.M.), Cancer (2 P.M.), Throat, Golden-square (9.30 A.M.), Guy's (1.30 P.M.), Royal Ear (2 P.M.), Royal Orthopædic (3 P.M.), Children, Gt. Ormond-street (9 A.M. and 9.30 A.M., Dental, 2 P.M.), Tottenham (Ophthalmic, 2.30 P.M.), West London (2.30 P.M.), Central London Throat and Ear (Minor, 9 A.M., Major, 2 P.M.).

THURSDAY (22nd).—St. Bartholomew's (1.30 P.M.), St. Thomas's (3.30 P.M.), University College (2 P.M.), Charing Cross (3 P.M.), St. George's (1 P.M.), London (2 P.M.), King's College (2 P.M.), Middlesex (1.30 P.M.), St. Mary's (2.30 P.M.), Soho-square (2 P.M.), North-West London (2 P.M.), Gt. Northern Central (Gynæcological, 2.30 P.M.), Metropolitan (2.30 P.M.), London Throat (9.30 A.M.), Samaritan (9.30 A.M. and 2.30 P.M.), Throat, Golden-square (9.30 A.M.), Guy's (1.30 P.M.), Royal Orthopædic (9 A.M.), Royal Ear (2 P.M.), Children, Gt. Ormond-street (9 A.M. and 2 P.M.), Tottenham (Gynæcological, 2.30 P.M.), West London (2.30 P.M.), Central London Throat and Ear (Minor, 9 A.M., Major, 2 P.M.).

FRIDAY (23rd).—London (2 P.M.), St. Bartholomew's (1.30 P.M.), St. Thomas's (3.30 P.M.), Guy's (1.30 P.M.), Middlesex (1.30 P.M.), Charing Cross (3 P.M.), St. George's (1 P.M.), King's College (2 P.M.), St. Mary's (2 P.M.), Ophthalmic (10 A.M.), Cancer (2 P.M.), Chelsea (2 P.M.), Gt. Northern Central (2.30 P.M.), West London (2.30 P.M.), London Throat (9.30 A.M.), Samaritan (9.30 A.M. and 2.30 P.M.), Throat, Golden-square (9.30 A.M.), City Orthopædic (2.30 P.M.), Soho-square (2 P.M.), Children, Gt. Ormond-street (9 A.M., Aural, 2 P.M.), Tottenham (2.30 P.M.), St. Peter's (2 P.M.), Central London Throat and Ear (Minor, 9 A.M., Major, 2 P.M.).

SATURDAY (24th).—Royal Free (9 A.M.), London (2 P.M.), Middlesex (1.30 P.M.), St. Thomas's (2 P.M.), University College (9.15 A.M.), Charing Cross (2 P.M.), St. George's (1 P.M.), St. Mary's (10 A.M.), Throat, Golden-square (9.30 A.M.), Guy's (1.30 P.M.), Children, Gt. Ormond-street (9 A.M. and 9.30 A.M.), West London (2.30 P.M.).

At the Royal Eye Hospital (2 P.M.), the Royal London Ophthalmic (10 A.M.), the Royal Westminster Ophthalmic (1.30 P.M.), and the Central London Ophthalmic Hospitals operations are performed daily.

EDITORIAL NOTICES.

IT is most important that communications relating to the Editorial business of THE LANCET should be addressed *exclusively* "TO THE EDITOR," and not in any case to any gentleman who may be supposed to be connected with the Editorial staff. It is urgently necessary that attention should be given to this notice.

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MANAGER'S NOTICES.

THE INDEX TO THE LANCET.

The Index and Title-page to Vol. I. of 1910, which was completed with the issue of June 25th, were given in THE LANCET of July 2nd.

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(Taken daily at 8.30 a.m. by Steward's Instruments.)

THE LANCET Office, Sept. 14th, 1910.

Date.	Barometer reduced to Sea Level and 32° F.	Direction of Wind.	Rain fall.	Solar Radio in Vacuo.	Maximum Temp. Shade.	Min. Temp.	Wet Bulb.	Dry Bulb.	Remarks.
Sept. 8	30·23	N.E.	...	115	66	55	55	58	Cloudy
,, 9	30·24	N.E.	...	78	60	50	52	55	Cloudy
,, 10	30·28	S.	...	93	66	48	50	52	Misty
,, 11	30·15	N.E.	...	95	66	52	54	57	Misty
,, 12	30·18	N.E.	...	107	64	52	53	56	Dull
,, 13	30·18	N.E.	...	109	63	49	50	55	Fine
,, 14	30·03	NNW	0·41	68	56	49	54	55	Raining

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